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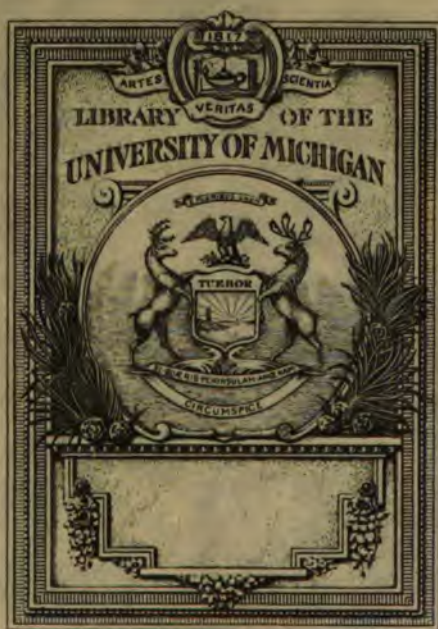
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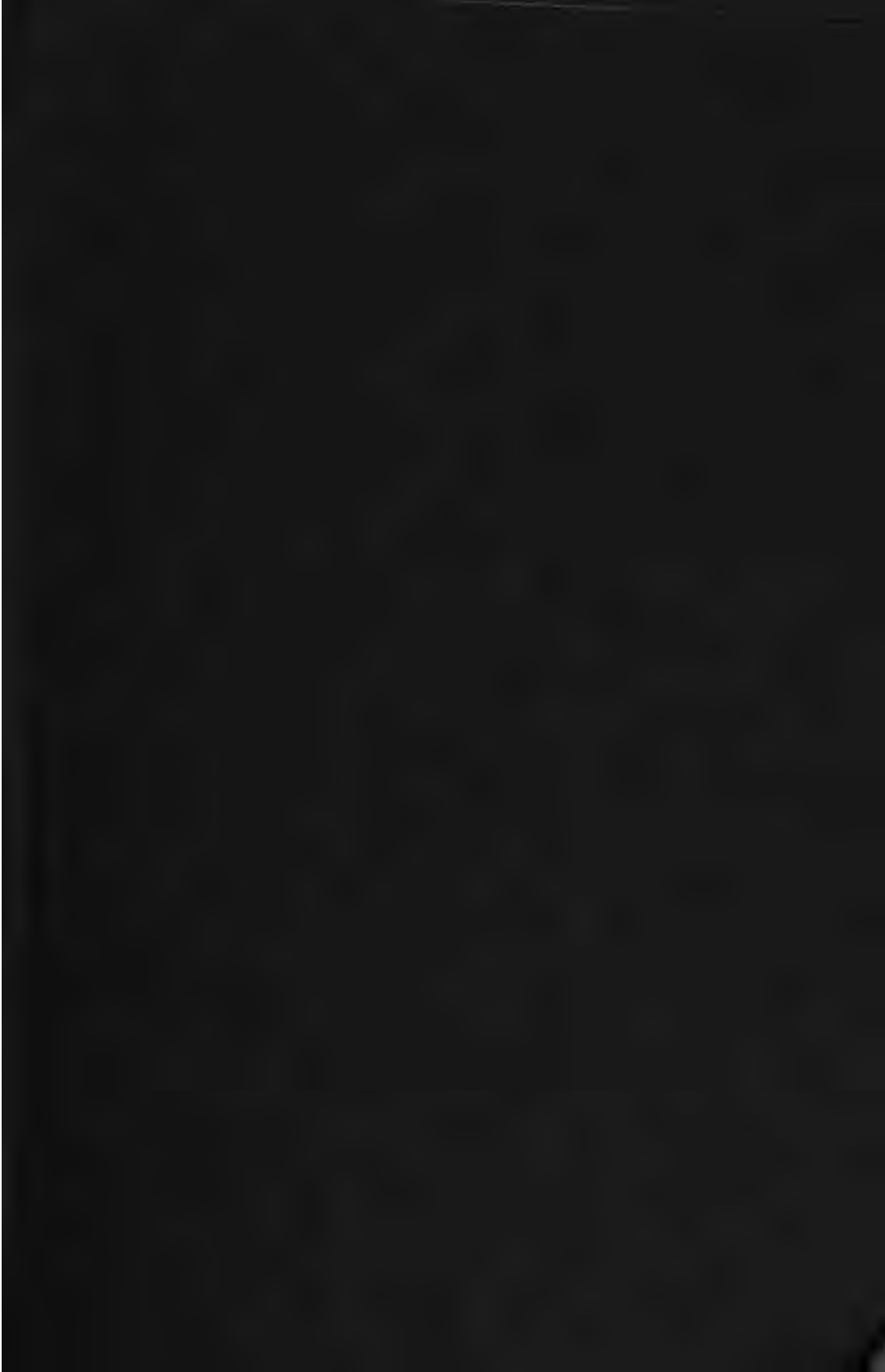
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ELEMENTS OF ORNAMENT
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CONTENTS

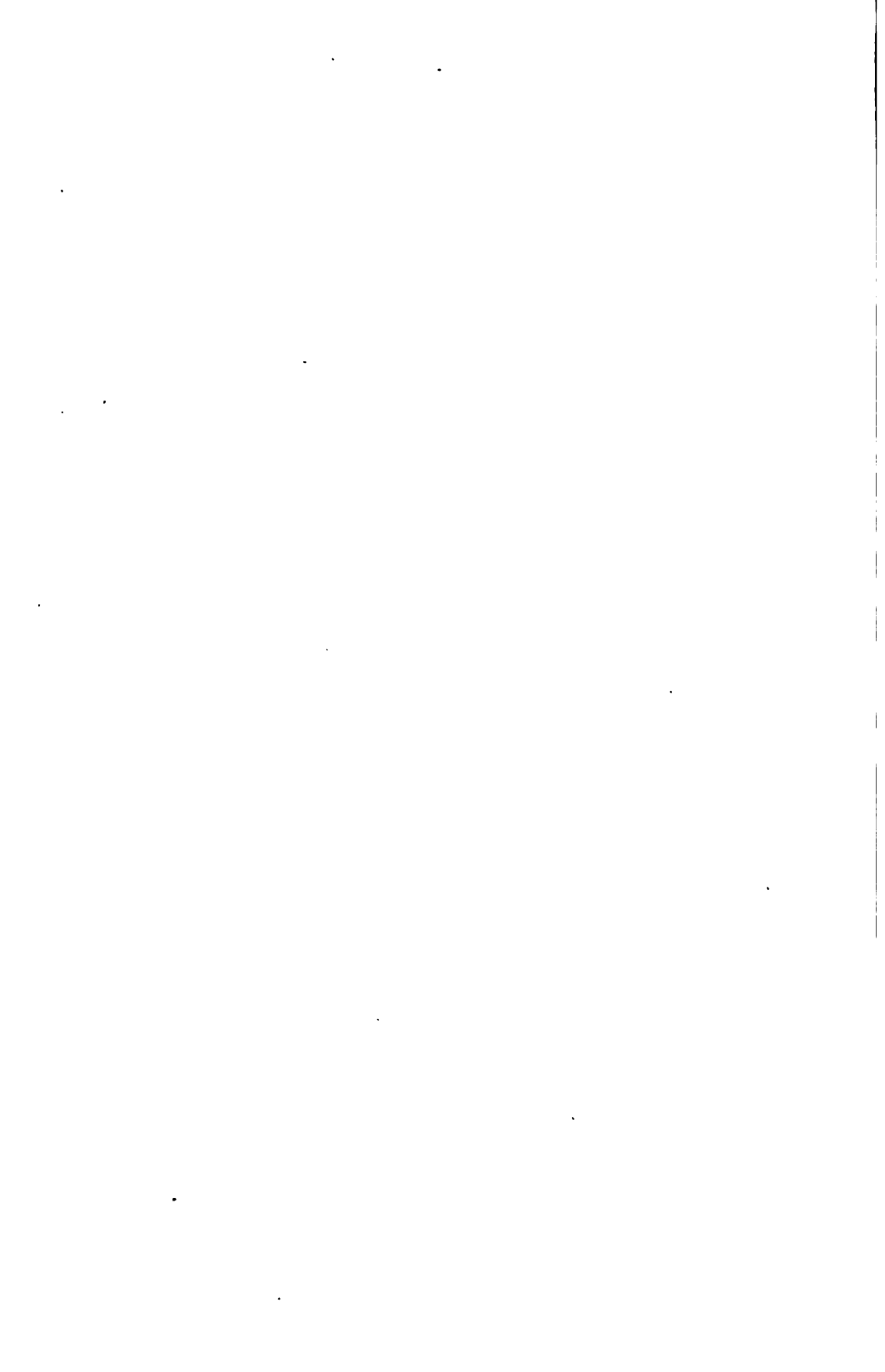
HISTORIC ORNAMENT	<i>Section</i>	<i>Page</i>
Introduction	3	1
Ancient Ornament	3	9
Primitive Ornament	3	9
Egyptian Ornament	3	14
Assyrian Ornament	3	45
Classic Ornament	3	49
Greek Ornament	3	49
Etruscan Ornament	3	71
Greco-Roman Ornament	3	72
Roman Ornament	4	1
The Five Orders of Architecture	4	2
The Greek Orders	4	2
The Roman Orders	4	17
Romanesque Ornament	4	33
Byzantine Ornament	4	39
Asiatic Ornament	4	59
Chinese and Japanese Ornament	4	59
Indian Ornament	4	64
Arabian Ornament	4	69
Turkish Ornament	4	76
Persian Ornament	4	78
Moorish Ornament	4	80
Western Art	4	95
Celtic Ornament	4	95
Gothic Ornament	4	99
Renaissance Art	5	1
Italian Renaissance	5	4
French Renaissance	5	24
German and English Renaissance	5	51

HISTORIC ORNAMENT—<i>Continued</i>	<i>Section</i>	<i>Page</i>
Conclusion	5	56
Historic Lettering	5	61
Antique Egyptian Alphabet	5	63
Light Antique Egyptian Alphabet	5	65
Heavy Antique Egyptian Alphabet	5	69
Medieval Roman Alphabet	5	69
Light and Heavy French Roman Alphabet	5	71
Gothic Alphabet	5	75
Old English Alphabet	5	79
 ELEMENTS OF ORNAMENT		
Composition	6	1
Surface Decoration	6	3
Conventionalism	6	12
Ornament	6	15
Natural Ornament	6	24
Conventional Ornament	6	28
Classification of Elements	6	34
Geometrical Elements	6	34
Architectural Elements	6	35
Industrial Elements	6	40
Natural Elements	6	41
Animal Elements	6	43
Human Figure	6	56
 PRACTICAL DESIGN		
Principles Involved	7	1
Planning the Design	7	5
Drop Pattern	7	12
Turn-Over Method	7	19
Variety of Methods	7	24
Borders, Corners, and Stripes	7	39
 APPLIED DESIGN		
Geometrical Considerations	8	1
Arrangement of Details	8	9
Application of Ornament	8	18
Hanging Fabrics	8	18

CONTENTS

v

APPLIED DESIGN—<i>Continued</i>	<i>Section</i>	<i>Page</i>
Wall Decoration	8	20
Ceiling Decoration	8	34
Floor Decoration	8	38
Utensils and Vases	8	41
Textile Fabrics	9	1
Character of the Threads	9	4
Yarns	9	7
Cotton, Flax, and Silk	9	12
Warp and Weft	9	13
Double Cloths	9	18
Jacquard Machine	9	25
Carpets	9	29



HISTORIC ORNAMENT.

(PART 1.)

INTRODUCTION.

1. Meaning of "Ornament."—The term **ornament** in its more limited sense is applied to such elements of decoration as are adapted or derived from natural forms. These differ from what we consider the geometrical elements, inasmuch as they are organic, and suggestive of life and growth. They depend for their expression on the general arrangement of their branches, leaves, and blossoms, while the geometrical elements owe their expression entirely to their geometrical form and arrangement relative to one another. When simply drawn on paper and in no way applied to any object, or used for any purpose other than the expression of itself, one of these elements of decoration may be considered simply as an ornament. It does not become an element of decoration until it is applied to something, and in the abstract, the term *ornament* should not be confused with the term *decoration*, which is distinctly *applied ornament*.

2. Meaning of "Decoration."—The term **decoration** signifies the application, or the result of the application, of ornament to objects or surfaces. It does not mean the simple "sticking on" of an ornament to a surface, but conveys the idea of the *adaptation* of an ornamental form to suit the requirements of its position and the purpose of the object to which it is applied.

§ 3

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The elements of decoration consist of geometrical lines, natural foliage, artificial objects, animals, and the human figure. All these may be considered as ingredients or components that may be mixed and applied in various proportions according to certain standard and acknowledged rules termed *principles*. The rule by which any one mixture is accomplished determines the style or class of the design.

3. Principles of Decoration.—The principles of decoration, considered separately and distinctly from the elements that are used to make up the design, are dependent on, and in harmony with, the rules of architectural proportion. This may be illustrated by considering the subdivision of a wall surface into three horizontal bands—the *dado*, the *wall*, and the *frisc*—in the proportion of the pedestal, column, and entablature of an architectural order. True, there are styles of design where these proportions are at variance with any architectural order; but, with few exceptions, these will be found to exist in styles or periods of historic art wherein the orders of classic architecture were unknown or misunderstood, as will be considered hereafter. This general division of a wall surface, however, may exist by the simple placing of horizontal lines to mark the heights, this subdivision being purely geometrical. The decoration may be extended by applying to the subdivisions such natural foliage as leaves and running vines; artificial objects, such as the hieroglyphics of the Egyptians; or animals, and the human figure, as seen in the Gothic and Renaissance work; or a combination of these forms. In each case, however, the main subdivisions are in accordance with general rules; and the surface covering, though governed by less restrictive rules, is, at the same time, subservient to a definite proportion of ornamented to plain surface, different under different circumstances.

4. Elements of Decoration.—Whatever the theme of decoration—whether it be the expression of the invention of a new idea, or only the arbitrary adoption of some familiar

form—two elementary conditions will always be found to exist: *first*, a decoration produced by an arrangement and joining of dots and lines, or by a combination of geometrical figures in accordance with the laws of rhythm, regulation, and symmetry; and *second*, a decorative effect arising from the attempt to represent objects from the external world.

The elements nearest at hand for imitation are found in organic nature with its plants, animals, and the human form; but inorganic nature also furnishes models, as in the forms of crystallization, such as snowflakes, and various phenomena, as clouds, lightning, waves, etc.; besides which there are rich resources open in artificial objects fashioned by man himself, as vases and utensils of daily use.

5. Combination of Elements.—It may now be more readily understood how all kinds of elements may be combined. Geometrical may be united with natural forms, and details and ideas suggested by natural forms may be combined with creatures of the human imagination to form eccentricities that do not really exist in nature, but that man has always delighted in adopting as representative of some higher or supernatural power. Illustrative of these, we have the sphinx, so identified with Egyptian art; the centaur and the mermaid in classic art; and the animal bodies with human heads, and the combination of beasts or fishes with the wings of birds, or with plant life and foliated terminations, prevalent in many details of Gothic and Renaissance art.

6. Symbolic Devices.—In heraldry and armorial bearings, with which the decorations of the Middle Ages and following centuries are replete, there are a number of devices with definite names that depend entirely on the combination of different characteristics, borrowed from different classes of animals, in order to combine in one figure the attributes of several natural beasts. For instance, we have the dragon, with the body of a serpent and the head of a carnivorous bird, and the wings of a bat, combining in the one animal the stealth and treachery of the snake, the cruelty and

passion of the vulture, and the uncanny and-silent secrecy associated with the nocturnal habits of the bat.

On the other hand, we have a variation of the form or characteristics of an individual animal, in order to emphasize those characteristics for the purpose represented. In many of the armorial devices of Great Britain is found a representation of a lion—never in the true form of the lion, as we are in the habit of thinking of him in the jungle, but a lion with a long attenuated body, generally with one or both fore paws raised from the ground, and always with his mouth open and protruding tongue and teeth. The lion is indicative of power and strength, and, consequently, of sovereignty. The attenuation of his body increases the feeling of liteness associated with animals of the cat tribe, while the expression given his face and forefeet is indicative of firmness, and power for aggressiveness, offensiveness, or defensiveness, as the case may require.

7. Influence of Architecture.—Decoration is applied art, and the forms used in decoration become varied according to the purpose for which they are used. Decoration, as applied to architecture, consists of the ornamentation of the structural features of a building—of the variation in color, or proportion of different surfaces that are adjacent, and of the introduction of familiar symbols, or objects, to convey a definite historical or religious idea.

To a certain extent, all decoration partakes of the same characteristics as architectural decoration. Wall decoration is architectural, and consists of the variation in color or proportion of adjacent surfaces, or of the same surfaces divided. The decoration of silks and tapestries, either in the weaving or printing, is a variation of surface that must be further considered in its architectural relation, when they are hung on the walls, over the doors, or around the windows, and seen, not as plain surfaces, but in folds. The treatment of furniture is an architectural decoration, both in the ornamentation of its structural features and in the application of symbols to portions of its surface. In fact, in all periods of

art, it will be found that any attempt at ornamentation is governed directly or indirectly by the prevailing tastes in architecture and the sister arts.

8. Conditions Influencing Architecture.—Though ornament and architecture have been steadily progressive from the days of earliest Egypt to the close of the nineteenth century, there is little resemblance between the characteristic ornament or architecture of any two periods, except where there has been a deliberate revival of a certain style of art. Where the artists of a nation or locality have been left to their own devices and originality, they have produced a style of ornament suitable to their purpose, their period, and their relations, that is in no way connected or suited to other surrounding conditions. Although the influences that have affected the style and character of the ornament of different periods are many, the religious and geographical influences are probably the strongest. Political influences determine, to a certain extent, the character, according to the government and relations of the people, and also the profusion and elaboration, and, to a certain extent, the quality of execution, of ornament; for the richer a nation becomes, the more she expends on her monuments of public utility and beauty, and the more elaborate her citizens become in the taste and decoration of their households. In fact, we find no art progress in any country until it begins to show signs of amassing wealth.

9. Influence of Religion.—The effect of religion in ornament can be traced through all periods, and those nations with whom religious belief was more closely intermingled with the civic and domestic duties of the day, expressed in every detail of their ornament some tribute to a superior being. During the laxity of morals and general religious fervor toward the close of the Renaissance period, we find few religious forms woven in the fabric of any class of ornament, except the pagan forms that were borrowed in ignorance from an antique religion and an ancient art.

This free use of symbolic forms, both ancient and modern, gives us an unlimited field for combinations in ornamental design, which, though practiced through fifty centuries, has not exhausted the possibilities for originality.

10. Decorative Art.—All decoration and decorative art, whether carved, painted, or modeled, is the expression of the wants, facilities, and sentiments of the age in which it is created. All products of decorative art should possess fitness, proportion, and harmony of both form and color, in order that the result may express what we term *repose*; and beauty results from that repose that the mind feels when the eye, the intellect, and the affections are satisfied, and free from any sense of want. As in architecture, construction may be decorated, but under no circumstances can decoration be constructed. Decoration must always form a part of the purpose or object with which it is associated.

It is useless to try to deceive the eye and intellect by carving a natural vine on a stone tablet. No right-minded person will ever take the imitation for the real vine, and the highest tribute that can be paid to it is that the carver was skilled with his chisel and hammer, and the designer had failed to understand and appreciate his material. If the vine is to be a stone vine, let it be reduced to a form that is suitable in stone; if it is to be a woven vine in a fabric, let its form be reduced to the limitations of results obtainable from the loom; if it is a vine to be painted on a wall surface, let it be a painted representation of the characteristics of a certain vegetable growth, and not a picture or portrait of an object that if real would be highly out of place where represented.

11. Conventionalism.—This proper representation of a familiar form according to the position it is to occupy, or the material in which it is to be executed, is called **conventionalism**, and is the first detail of applied art that the designer must learn to comprehend. An old axiom states, "That which is beautiful must be true," and we may add

to it conversely, "That which is true must be beautiful," and on this axiom depends all the beauty of ornament in architecture, decoration, and the allied arts.

Ornamental design is not portrait painting—it is not the faithful portrayal of the details of nature for purely pictorial purposes. The skill of the artist in this branch of art is applied to making something of simple utility an object of beauty; whereas, the portraitist is engaged in rendering on canvas, or other surface, an absolute portrait of the subject before him.

12. Consistency in Designing.—The decorative designer must have in mind the construction or fabrication of a useful article, with the value and utility of which he combines his art. The figure portraitist, landscape portraitist, or floral portraitist, if we may so distinguish them, has before him a subject that he intends to translate in paint to a surface that shall have nothing associated with it in the mind but the figure, the country, or the flowers it represents. If the decorative designer takes the same subject, he does not represent it with the same fidelity, because it is applied to a utensil, and the object of the utensil must not be lost sight of; and if he decorates the surface of a utensil or dress material with a design that claims to be an absolute portrayal of the flower or other device itself, he states in his decoration that this is nothing but the representation of a flower and he draws the mind away from the fact that it really is a utensil; this is not true, and, according to the foregoing axiom, the result cannot be beautiful.

13. If, in the weaving of a carpet, or other floor covering, the designer attempts to portray natural bunches of roses and rose leaves, he is suggesting to the observer that this is a picture or portrait of a bunch of roses, executed entirely to please the senses as a portrayal of the flowers themselves, which is not true; for, if it were, we should hang it near the level of the eye, separating it from any sense of utility, other than the conveying of a feeling of

satisfaction and delight to the affections and to the intellect; whereas, as a matter of fact, it is a floor covering decorated with an out-of-place design.

14. General Rules.—In the decoration of a surface, the general form is first cared for and subdivided or ornamented by general lines; the interstices may then be filled with ornament and may themselves again be divided and fully enriched for closer observation. But all ornament, no matter how minutely carried out, should be based on a geometrical system of construction, as a true proportion will be found to exist between all members so based.

In all surface decoration, a rule to be observed is that all lines should be traced back to their branchings from a general parent stem, so that each detail of the ornament, no matter how distant, can be traced back through its branch to the root. This makes the design rational, but the connection with the parent stem and root must not be so marked as to dominate the spirit of the design. Another rule requires that all junctions of curved lines with other curved lines, or of curved lines with straight lines, should be so made that they are tangent to each other at the point of junction, if they are intended to express parts of the same design. And a third rule says that flowers and other natural objects should not be used as ornaments in their natural forms, but should be conventionalized or reduced to geometrical principles that convey the idea of their representation without purporting to be a likeness of the original, for the reasons heretofore set forth.

15. Color may be used to assist in the development of a form or idea, or to distinguish objects or parts of objects, one from another; or color may be used to assist light and shade, helping undulations of light and form by the proper distribution of several different tints. Color should never be used, however, where the exigencies of the case do not positively require it. Every design should depend for its intrinsic beauty on its form and its proportion, and these

may be enhanced by combinations and relations of color; but the design is a poor one that depends entirely on color for its attractiveness and beauty.

With this understanding of the facts, let us now consider what has been done by our predecessors in the field of ornamental design.

ANCIENT ORNAMENT.

PRIMITIVE ORNAMENT.

16. Under primitive ornament, we will consider those efforts at ornamental design observable in the works of the savage tribes. These peoples had no written history of art from which to draw ideas, no theory or rules of proportion to govern their conceptions, and, consequently, the expression of art as exhibited in their decorated utensils can be considered pure and untrammelled.

17. Influence of Nature.—From the testimony of travelers in but partially explored countries, it would appear that there is no place on the face of the earth where some attempt is not made at ornamentation, no matter how crude a state of civilization the people may be in. The desire for ornament is present in every race, and it develops and increases in importance directly in proportion to their progress in civilization. Man appears everywhere impressed with the beauties of nature that surround him, with the mysteries governing the growths and phenomena that he cannot understand; and he seeks to imitate, within the limitations of his power, some of the works of his Creator. The earliest instinct of man is to create something; no matter how powerful he may be as a warrior, how distinguished he may be as a tribal leader, or how wealthy he may be in the possession of earthly goods, he recognizes his inability to explain the phenomena of nature, and naturally attributes it to a being higher than himself. It is at all times

apparent that this being, whom he in his primitive way may worship as a god, creates, by some undefined power, developments and appearances that inspire him with mystery and awe. Consequently, he endeavors, in his own simple way, to call into existence creations of his own that shall impress those fellow men whom he considers his inferiors as much as he is impressed by the works of his mysterious Supreme Being.

18. Origin of Tattooing.—In some savage tribes, this desire is expressed in the attempt to increase the facial expression by which he expects to strike terror to his enemies, rivals, or inferiors, or to create what appears to him a new and mysterious beauty. This he accomplishes by tattooing, or sometimes merely with paint. It is a remarkable fact that hideous as this practice renders his visage, it is, in most cases, exercised with the greatest care that the lines shall be so placed as to *increase* the facial expression and *develop*, to the greatest extent, the eccentricities of his natural features. Trivial as this detail may at first appear, it lies at the bottom of the fundamental principles of decorative design. The savage warrior does not obliterate his own expression and cover his face with paint and tattoo marks to create a new one, but simply arranges the lines to emphasize the details of severity that he already possesses and with which he expects to inspire an impression of terror.

19. Origin of Set Styles.—It can be clearly shown throughout all history that in certain periods, an individual mind, stronger than those with which it is surrounded, will impress itself on a generation and carry with it a host of other minds of inferior power. These inferior minds imitate what they know to be better than what they can create, but do not imitate so closely as to destroy their own individual ambition to originate. It is to this tendency that we owe the birth and the modifications of styles.

The efforts of the people in the earliest stages of civilization are like those of children, though lacking in power of

expression, they possess a grace and originality rarely found in middle age, and never in manhood's decline. The same may be found in the infancy of any art, which we will endeavor to point out as we go along. When art struggles for an existence, it succeeds by creating for itself new forms and new ideas, but, when reveling in its own successes, it fails.

20. Effect of Traditional Styles.—The pleasure we receive in contemplating the crude attempts at ornament of the most primitive tribes arises from our appreciation of a difficult accomplishment. We are interested in the evidence of the intention, and are surprised at the simple and child-like rudeness by which the result is accomplished. In fact, what we seek in their work of art is the evidence of mind—the evidence of that desire to create to which we have already referred. This evidence of mind, strange to say, is much more readily found in the rude attempts at savage ornament than in the innumerable productions of a highly advanced civilization.

When art is manufactured by a combined effort, instead of being originated by the efforts of an individual, the true instincts, which constitute its greatest charm, are lost. By this we mean that the art of the present day is the result of the combined efforts of artists and artisans through centuries of development, whereas the art of the savage tribes is the expression of the mind of an individual warrior, untrammelled by tradition.

21. Expression of Taste in Savage Ornament.—In Fig. 1 is shown a reproduction of a cloth pattern, the original of which came from the savage tribes of the Samoan Islands. It is made from thin sheets of bark stripped from a peculiar species of tree, and is beaten out and united so as to form one long parallelogram of cloth. Certainly nothing could be more primitive as a method of manufacture, yet the pattern shows the existence of taste and skill, and an ingenuity of design rarely found in many of our woven fabrics of the

present day. The pattern is executed by means of small wooden stamps, and the work, though rude and irregular in its execution, conveys the intention at every point. There is a skilful balancing of the masses and a judicious avoidance of

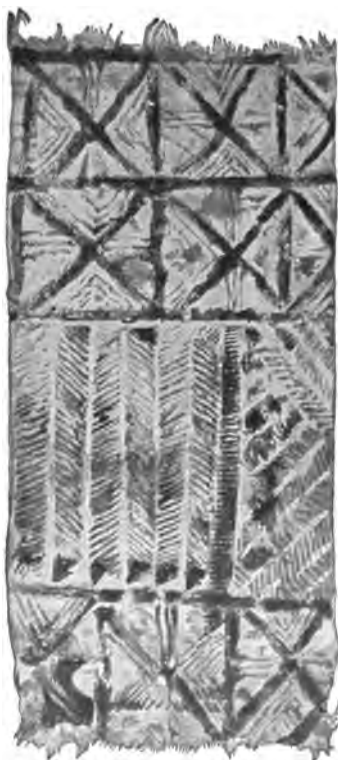


FIG. 1.

lines that would tend to cause the eye to run in one direction. This is done by opposing each set of lines with others of opposite tendency. There are many styles and patterns of this work, all of which show positive genius in their arrangement and development.

22. Decorative Theory Exhibited by the Savage.—

The next development in this primitive art is found in the attempts at wood carving, and the most likely place to look for it would be on the weapons used for the defense of the tribe, or in the chase of animals for food. The bravest or the most skilful of the warriors or hunters would desire to distinguish himself somewhat above the others by the possession of a weapon, not only more useful, but, in

his eyes, more complicated, and more beautiful. The best shape for the weapon he has already determined by experience, and the enriching of its surface by carving naturally follows.

The eye of the warrior being accustomed to the geometrical forms and details of the stamped cloths, his hand attempts to imitate them in the handles of his wooden utensils by means of knife cuts, and the paddle shown in Fig. 2 illustrates how faithfully this representation has been carried out.

This instrument is from New Zealand, and the taste exhibited in its carving would bear favorable comparison with the art

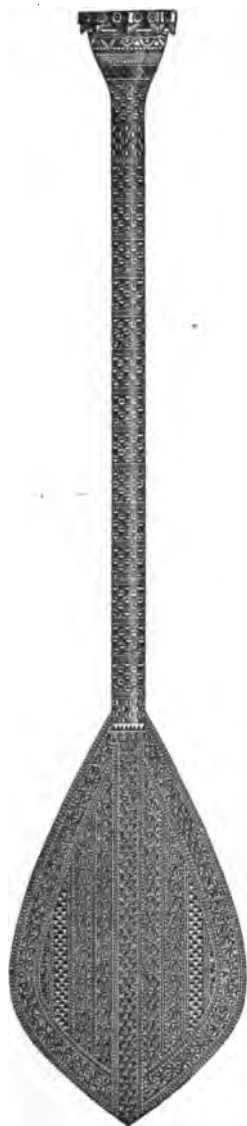


FIG. 2.

works of the highest state of civilization. There is not a line on its surface misapplied; the general shape is most graceful and elegant, and the decoration is applied everywhere to best develop the form.

The New Zealander's instinct taught him that his paddle should be strong, not only in reality, but in appearance, and his ornament is so disposed as to give an appearance of strength greater than it would have had if the surface had remained undecorated. The band in the center of the length of the blade is continued around both sides, binding the border that extends around the edge, and this latter appears to hold in place all the other bands. Had these bands run out like the center one, they would appear to have a tendency to slip off, as the center one is the only one that can occupy its position around the end of the paddle with repose.

23. Value of the Study of Historic Ornament.—These few facts have been pointed out in the preceding pages, so that the student may fully appreciate that beauty of ornament does not depend on the fidelity with which ancient ornament can be copied. The natural tendency of the mind will produce good results in the application of ornament in nearly all cases, if it is allowed to work

logically and without influence from stereotyped or historical forms.

The study of historic ornament is practiced to familiarize the student with what has been done heretofore, to point out to him such parts of the ancient works as have been done well, and to show him why they are considered to be done well, and also to render him familiar with other works of celebrated art periods which, though they may be beautiful in themselves, are not, as a matter of fact, as high a grade of art as our New Zealander's paddle, because of the lack of expression of mind in the designs, and the tendency to imitate the works of what was believed to be a superior mind, rather than to develop a new style along new lines.

24. How to Study Ornament.—From what has already been said, it will be easily understood that the ornament of a people carries in itself the characteristics of that people. It must be interpreted, however, by the aid of the history of the people as expressed in their monuments. The subject of historic ornament should therefore be studied, not only with regard to its grace and beauty, but as a key to a portrayal of the qualities, characteristics, and disposition of the people to whom it belonged.

In the consideration of the ornament of a country, we must first investigate all the details that are likely in any way to affect the art, in order that we may better understand why certain characteristics exist in the ornament of one people and are entirely absent in that of another.

EGYPTIAN ORNAMENT.

25. Influence of the Nile on Egyptian Ornament. It seldom or never rains in Egypt, except in the delta at the mouth of the River Nile, and nature has provided for the fertilizing of the land by an annual overflow of the river that brings down mud and alluvial soil from the mountain regions, and deposits it on top of the old soil, thus enriching it. For three months the water slowly rises in the Nile

Valley, and, for three months following, the river slowly subsides and then remains a narrow stream for the rest of the year, bordered by green fields of cotton and grass. The phenomenon of this yearly inundation of the Nile, Fig. 3, slow, majestic, and munificent, naturally impressed the early Egyptian with a feeling of mystery and awe. In fact, in this inundation lies the key to the wealth of ancient Egypt.



FIG. 3.

Dwelling during the dry season on what would appear to be a barren plain, the Egyptian saw the provision of a Supreme Being working for his good when the waters of the Nile gradually overflowed, fertilized the soil, and then slowly subsided, leaving him to plant his seed. It is not strange, therefore, that the Nile and everything associated with it should be sacred. In all Egyptian ornament, we find some symbol or detail that reminds us of this great beneficence of Providence and favor to the Egyptian. The Egyptian was an appreciative mortal, and in his art and architecture everywhere placed some reminder of the fact that he could do nothing and would be nothing without the care and watchfulness of this supreme power.

26. Antiquity of Egyptian Ornament.—In studying Egyptian ornament, however, we cannot begin at the

beginning, as we can with other styles, inasmuch as we have no historical records of any beginning. A peculiarity of the Egyptian over all other styles is that the more ancient the ornament, the nearer perfection is the art. Architectural monuments, erected 2,000 years before the Christian era, are built of stones taken from the ruins of much more ancient buildings that were really more perfect. We are therefore compelled to study Egyptian art during a period of its decline, but can accept the style as absolutely original, inasmuch as we have no record of the existence of an earlier nation from whom they could have borrowed it.

In Egyptian art, there are no traces of infancy, nor of foreign influence, and it is safe to infer that the Egyptian artist drew his inspiration directly from nature. The types of his ornament are few but perfectly natural, and in the earliest period of Egyptian art, the representation is but slightly removed from the type; but the later we descend in history, the more we find the original types receded from, until it is difficult, in many cases, to discover from what original idea the ornament, by successive mental efforts, has been developed.

27. Influence of Religion.—Although the Egyptians decorated every article of utility that was in any way associated with their civil, domestic, or religious duties, we depend for examples of their ornament almost entirely on the designs and writings executed in connection with their complicated form of religion.

The temples, tombs, and other sacred monuments of the most ancient inhabitants afford us the most rational and progressive examples of ornament, and it is from these that we derive nearly all the information that we have of the manners and customs of the early Egyptians. In the temples are preserved certain stone tablets and other devices, on which are records of certain ceremonies in connection with their religion, and these records are always executed in their peculiar form of hieroglyphs. The word *hieroglyph*, being literally translated, means sacred writing, but in its specific

sense is used to indicate the peculiar pictured descriptions of the Egyptian religious ceremonies that are found carved and painted on the walls of their tombs and temples.

28. The **Egyptian temple** consisted of a small sanctuary, or *sekos*, as it was called, that was reached through a large columnar hall known as the *hall of assembly*, or sometimes the *hypostyle hall*, the latter term meaning covered over on columns. In front of the hypostyle hall was a large open court, surrounded by high and massive walls and



FIG. 4.

entered between two tower-like front walls, called **pylons**. Each of these parts was varied slightly in different structures, some having two courts in front of the hypostyle hall, known as the outer and inner court, and in many of the temples the *sekos* was surrounded by a number of smaller apartments. On the outside of the temple, the entrance was approached through a long avenue—often a mile or more in extent—lined on each side with colossal sphinxes, and occasionally

ending in a large monumental gateway advanced before the main entrance to the temple, as shown in Fig. 4. This gateway was called a **propylon**, and it stood alone before the main entrance like a silent sentinel. The example shown in Fig. 4 is from the temple of Rameses III, at Karnak, and from this a fair idea of the magnitude of these great architectural details may be obtained. The faces of the propylon were always decorated with elaborate hieroglyphic devices as shown, and over the top was carved the *winged globe*, of which we shall have occasion to speak hereafter. Beyond the propylon stand the two great pylons that form the outer front wall of the building, and the entrance between these two masses is similar in detail to the gateway advanced in front.

A better idea of this arrangement can be obtained from Fig. 5, which shows a portion of the avenue, the entrance, and pylons of the temple of Edfou, in Upper Egypt. In

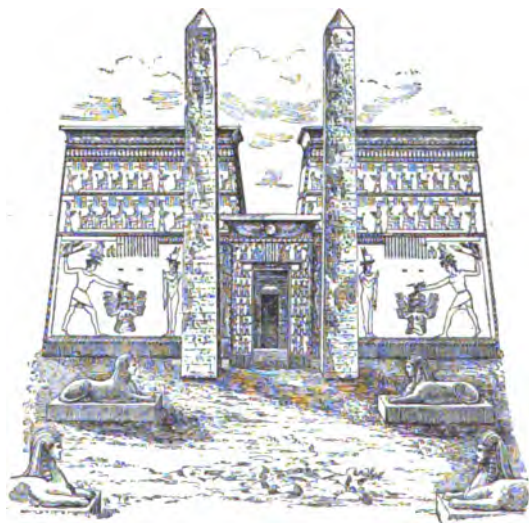


FIG. 5.

this case, the propylon is omitted, and at the end of the long avenue of sphinxes stand two great obelisks—one on each side of the entrance. The walls of the pylons themselves are decorated in hieroglyphs, the design at the bottom

representing a group of prisoners, taken from Palestine, about to be executed by the king.

29. Interior of the Temple.—On the inside of the temple, these pylons are sculptured in much the same manner, though the lower part of them is largely covered by the roofed passageway around the edges of the court. Fig. 6 is



FIG. 6.

a reproduction of a photograph taken in the inner court of a temple on the island of Philæ, and shows the appearance of these pylons on the inside, and a portion of the columns supporting the roof on the right side of the court. The pylons were massive structures, and contained, in their interior, a number of secret rooms accessible only to the priest and members of the royal family.

An entrance to the interior of one of the pylons is seen on the left of Fig. 6, and it will be observed that the general treatment around the door and over it is precisely the same, but on a smaller scale, as the main entrance to the temple

and the general character of the pylon illustrated in Fig. 4.

A better idea of the massiveness of these pylons may be obtained from Fig. 7, a photograph of the temple of Edfou, showing the taper of the walls from the ground upwards, a characteristic of all Egyptian architecture. This illustration is taken from above the side walls of the temple, so



FIG. 7.

that the entrance columns of the hypostyle hall at the rear of the court may be seen, and by comparing Fig. 7 with Fig. 5, both being illustrations of the same temple, a fair idea of the state of preservation of this great edifice may be obtained, Fig. 5 representing it in its original form and Fig. 7 being a photograph of it at the present day.

At the top, the walls of the pylons flared out, forming a simple concave cornice, above which gleaming cressets at night and flaunting banners by day were carried on long iron stocks or staffs, which, combined with the highly colored decorations on the walls, gave the building an effect

of mysterious grandeur, perfectly consistent with the complex system of the ancient Egyptian belief.

The iron stocks carrying the banners, etc. were inserted in the recesses shown on each side of the entrance.



FIG. 8.

30. Obelisks.—The obelisks in front of the temple are in themselves characteristic of Egyptian art. Each of these consisted of a tall stone shaft, quarried in a single piece,

and sculptured on four sides with elaborate hieroglyphic ornament. A photographic reproduction of one of these interesting details is shown in Fig. 8. This was one of a pair of obelisks known as "Cleopatra's needles," and is shown as it stood in the city of Alexandria, Egypt, for nearly 2,000 years. It is 67 feet in height, and 7 feet 7 inches square at the base. It originally stood with its companion before the entrance of the temple at Heliopolis in Lower Egypt, but was removed to the city of Alexandria after the defeat of Anthony and Cleopatra by the Roman emperor Augustus, just before the beginning of the Christian era. In the year 1878 it was removed from Alexandria and transported to New York City, where it now stands on a mound on the east side of Central Park.

31. The temples differ widely in size and elaboration of plan, but the general scheme of arrangement is the same in all cases, whether the example is taken from Northern Egypt or Southern Nubia. Between the years 1600 and 1100 B. C., the greatest temples were built. The Pharaohs

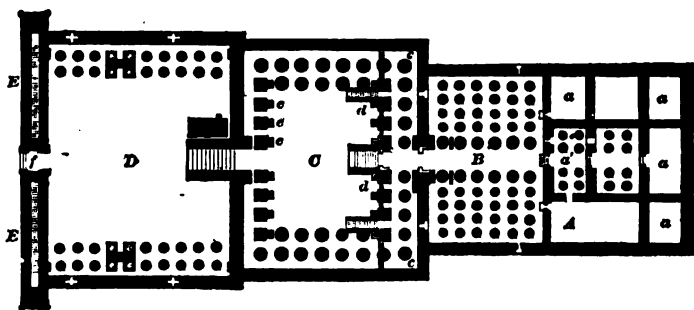


FIG. 9.

wanted eternal dwelling places for their deities, and built their temples entirely of stone, laid up in blocks so massive and so well fitted that they have withstood the ravages of time down to the present day.

In Fig. 9 is shown the plan of the Ramesseum, a temple built by, and named after, Rameses, one of the kings of Egypt, who reigned about 1500 B. C. Here the sanctuary

is shown at *A*, surrounded by a number of smaller apartments *a*, which were used by the priests and members of the royal family, both as places for their mysterious devotions and as royal residences; the king and his immediate relatives being considered earthly representatives of the gods. The sanctuary contained the shrine, and was entered through either of two portals, one from the hypostyle hall *B* and the other communicating with one of the sacred apartments *a'*.

At *B* is shown the hypostyle hall, the roof of which was supported by two sets of columns, the central ones being



FIG. 10.

longer than those on each side, in order to provide a clear-story for the admission of light and air.

This is more clearly shown in Fig. 10, which is an illustration photographed from a restored model of the great hypostyle hall in the temple at Karnak. At *a* is seen the double row of long columns, which are connected longitudinally by the stone lintels *b*, in order to receive the edges of

the stone slabs *c*, which form the roof over the *nave*, or central portion of the temple. On each side of these are the shorter columns *d*, which are connected transversely by the lintels *e*, and the inside row longitudinally by the lintel *f*, to support the roof slabs *g* in the same manner as over the nave. An open space *h* is thus left to admit light to the interior of the hall, and form a clearstory similar to the same detail in our more modern cathedrals, of which we shall learn later on.

The spacing of the supports being governed entirely by the length of lintel the builders were able to quarry, the columns are exceedingly close together. For this reason, large apartments were never entirely roofed over in the Egyptian temples, but were open to the sky, either wholly or in part, as shown in Fig. 9 at *C*, which is the inner court of the temple, from which the hypostyle hall must be entered.

On each side of this inner court is a double row of columns supporting a roof extending from the side walls, while at the back is a single row of columns *c*, and a row of square piers *d*, which carry a portion of the roof that extends over from the hypostyle hall. Another row of square piers *e* carries the roof over the front end of this inner court, which, with the other partial coverings, surrounds the court with a narrow projecting roof on all four sides.

32. The effect of this treatment must have been very imposing in itself, but, to add to the impression, colossal statues were carved on the inside faces of the square piers, and flights of stone steps led up to a gallery at the level of the hypostyle hall, the floor of which was considerably above the level of the inner court. The outer, or entrance, court *D* was a comparatively plain enclosure, with columns on each side and a single flight of steps up to the floor of the inner court above. It was entered through a narrow portal *f*, flanked on each side by the massive pylons *E*, and served merely as an entrance court preparatory to the grandeur and solemnity of the more sacred apartments beyond.

33. The early Egyptian statues were usually colossal in size, and there was no attempt at economy or saving of time in any structure that was erected for the purpose of religious ceremony or the burial of their dead. The pyramids (see Figs. 3 and 11) were erected as tombs for the kings, and give a very fair idea of the patience and persistence of this ancient people, that would work 100,000 men for 20 years on a tomb for the body of their king, at a cost of over \$40,000,000. It is a mystery to this day how the stones were quarried and transported with the primitive tools and machinery in use 3,000 years before the Christian era, for this great pyramid of Cheops, 800 feet square at the base, and 450 feet in height, is the largest structure in the world today.

34. The Great Sphinx.—Next to the pyramids in massive grandeur comes the Great Sphinx at Gizeh. This is a statue of the Egyptian god Harmachis, carved out of solid rock, making a figure 146 feet long, 65 feet high, and



FIG. 11.

34 feet across the shoulders. The body, which has the form of a crouching lion, is now entirely buried in drifted sand, but the human head, measuring 28 feet from chin to top, and the broad, massive shoulders, are still visible above the

sand drifts, as shown in Fig. 11. Between the forefeet of the body is excavated a temple where the god was worshiped, and, if built at the same time as the sphinx, this temple is the oldest architectural monument on record, as it antedates the pyramids over 1,000 years.

35. Types of People.—There were two types of people among the Egyptians, varying decidedly in physique and intellectual appearance. One type of aristocratic origin possessed a refined face, with a moderately high forehead, aquiline nose, rather full lips, and rounded chin; the other type was from plebeian stock, with low forehead, short nose, heavy jaws, and very thick lips. The former was serious and thoughtful, grave, dignified, and religious; the latter gay, pleasure loving, light hearted, and good natured. These two types are represented in many of their hieroglyphs and wall paintings, and are often used as symbols of the very attributes we ascribe to them. The lower type have been used to express some degraded or inferior people, and the more refined type have been used to represent royal personages and the gods.

The kings and royal families in Egypt being considered earthly representatives of the gods, had privileges in the complicated system of Egyptian religious rites that the priests themselves did not enjoy. An offering to a king was equivalent, under certain circumstances, to an offering to one of the gods. The Egyptians worshiped many gods, but the chief ones were Osiris, Isis, Horus, and Thoth. They also paid religious regards to animals. Cats, dogs, cows, hawks, beetles, and monkeys were sacred throughout all Egypt, as will be seen hereafter.

36. The Lotus and Papyrus.—The most conspicuous type in Egyptian art is the lotus (Fig. 12), a plant growing on the banks of the Nile, somewhat resembling our pond lily, but differing from it in coloring. The lotus leaves float on the surface of the water at the end of a long stem, in the same manner as do the pond-lily leaves, but the blossom

stands on a stiff stalk high out of the water, and is of a brilliant purple color on the border petals, with a heart of deep orange. The lotus was a sacred flower, and as an offering to the gods was conspicuous in the highest forms of worship.

It is easy to understand the importance of the lotus in Egyptian religious theories. The deified lotus stands representative of the homage rendered to the beneficent action of water and sun on the sleeping earth. It is the symbol of the annual evolution of the seasons, causing generation to succeed generation, and the return of life, where everything had seemed barren in the immobility of death.

The **papyrus plant** was also used largely in Egyptian art and associated with the Nile on whose banks it grew, but not to such an extent as the lotus. From the papyrus plant a



FIG. 12.

kind of paper was manufactured on which the Egyptians wrote many of their sacred legends, and it is from the name of this plant that the modern word "paper" is derived.

37. The Winged Disk.—The sun itself was also the object of direct worship, the ceremony of which was varied by the priests in order to make it penetrate more deeply among the masses. The disk, as representative of the sun, is used in many Egyptian hieroglyphs, and received a certain

share of homage owing to its relation to agricultural development after the Nile had completed its inundation. A combination of the disk and feathered forms produced an ornament generally known as the winged disk, or the winged globe (Fig. 13). This consists of the solar disk, supported

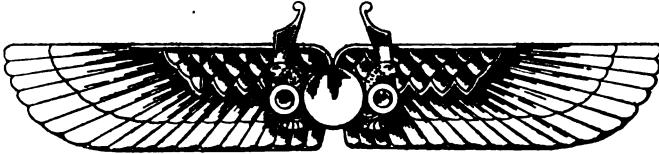


FIG. 13.

on each side by an asp (the royal symbol of Upper and Lower Egypt), and the wide outstretching wings symbolize the untiring activity of the sun in its beneficence; hence, a divine protecting power. It is emblematic as a whole of the triumph of right over wrong, and an inscription at Edfou says that Thoth, the god of speech and wisdom, ordered that this emblem should be carved over every door in Egypt. It is everywhere apparent in Egyptian sacred painting, but varies slightly in detail according to the place where it is used. Wherever it appeared carved over the doorway of a temple, painted on the walls of a tomb, or woven into a fabric of the vestments of a priest or king, this emblem was a monument of the Egyptian's religious sincerity and appreciation of benefits derived from his god.



FIG. 14.

38. The Scarabæus.—The scarabæus, or beetle, Fig. 14, was identified with the rising sun, and typified creation and resurrection, or new birth. Its exact significance is somewhat complicated, as are in fact all Egyptian emblems; but, owing to the habits of the beetle, slowly developing from a grub through various stages to a full-grown insect, it is emblematic of progress and evolution. In the tombs and ruins of the Egyptian temples are found

thousands of models of these beetles that seem to have been worn as amulets.

39. Consistency of Egyptian Ornament.—Another type of Egyptian ornament is the palm, from which canopies were made, and also the fans and shades that were held over the heads of royal personages during ceremonies, to protect them from the sun. These few types form the foundation of an immense variety of ornament with which the Egyptian decorated the temple of his gods, the palace of his kings, the covering of his person, and his articles of luxury, as well as those articles of more modest daily use, from the wooden spoon that fed him in infancy to the mournful boat that carried his embalmed body across the Nile to its final resting place in the Valley of the Dead. Following these types in a manner so nearly allied to the natural form, they observed the same laws that the works of nature ever displayed, and, no matter how conventionalized their ornament ever became, it was always true. The Egyptian artist never violated a natural principle, and, on the other hand, he never destroyed the consistency of his conventional representation by too close an imitation of the type. A lotus flower carved in stone, or forming the graceful termination of a column, or painted flat on the walls as an offering to the gods, was never a lotus portrait, and never impressed the beholder as one that might be plucked, but was always the architectural representation of it suited to the material in which it was cut, or the colors in which it was rendered.

40. Conventionalism.—A good idea of the simple conventionality of their forms can be obtained from Fig. 15, where at (a) is shown the conventional representation of the lotus blossom, the outside leaves of which, in colored work, were usually painted a deep green. The first row of petals was also green, but of a lighter shade, while the innermost petals were red. The space between the petals was painted a deep yellow. At a distance from the eye, the red and yellow seemed to blend together and form a deep orange

hue with a suggestion of surrounding green, characteristic of the general appearance of the lotus flower.

The transition from (a) in Fig. 15 to the form shown at (b) is by no means a difficult matter, the omission of the innermost row of petals being the only radical change. From (b) to (c) is a simple development wherein the calyx

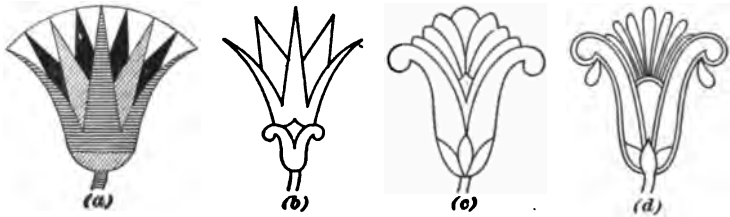


FIG. 15.

of the conventionalized flower has become larger in proportion to the petals, and from (c) to (d) is but a step in ornamentation, showing the gradual growth of design from the conventionalized rendering of the blossom itself to a device that is purely ornamental and derived from, though in no way representative of, the Egyptian lotus. The further development of this form in Assyrian and Greek art will show the importance of this line of study.

41. Classes of Egyptian Ornament.—Egyptian ornament may be divided into three classes: that which is *constructive*, or forms a part of the monument itself; that which is *representative*, but is at the same time conventionally rendered; and that which is simply *decorative*. In each class, the ornament is always symbolic, and the few types mentioned, upon which it is founded, we find are but slightly changed during the entire period of Egyptian civilization.

42. The student of historic ornament should familiarize himself with the difference between the terms *style*, *class*, and *type*. The term *style* is used to indicate the period or nationality of the ornament, as the Early Egyptian style; the term *class* is applied when we wish to indicate a subdivision of some style, as the constructive class of the Egyptian

style. The term **type** is used to refer to the natural form from which the ornament is derived, as the lotus type of Egyptian ornament.

43. Constructive Ornament.—Of the constructive ornament are the columns and their terminations, and the crowning members of the walls. The column base was fre-

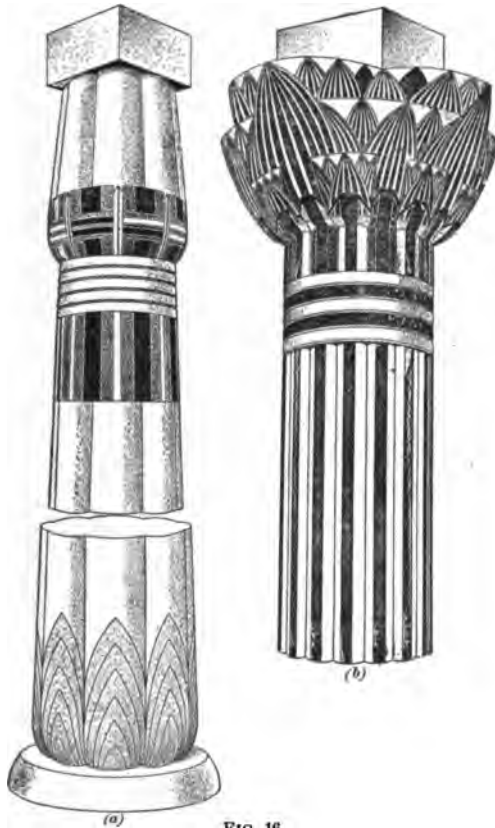


FIG. 16.

quently molded to represent the root, and the shaft was reeded in representation of the stalk, while the capital was carved similar to the form of a bud or full-blown lotus flower, as shown in Fig. 16, where at (a) is seen the bud

capital, and at (b) the capital derived from the full-blown flower. All this was symbolic, as the lotus meant much to the Egyptian.

In Fig. 17 are shown two square columns standing in the ruins of the temple of Karnak, the one to the left being decorated with a lotus flower carved in high relief, while the one to the right is similarly decorated with the papyrus



FIG. 17.

plant. The plain, severe treatment, so characteristic of Egyptian art, is forcibly illustrated here.

Another form of column flares out at the top, and has for its original type the papyrus or palm tree, as shown in Fig. 18. This style was usually placed in the center of the halls of assembly, with the lotus-bud columns on each side, as shown in Fig. 10. All columns were richly colored and sometimes decorated with hieroglyphs.

Feathers were held by the Egyptians as emblematic of sovereignty, and the cornices of their temples were usually decorated with ornaments derived from a combination of feathered forms.

44. Representative Ornament.

The second class of Egyptian ornament results from the conventional representation of commonplace things upon the walls of their temples and tombs. In this kind of ornament each representation is not only a detail of the wall decoration but is a hieroglyphic record of a fact. Sometimes it was carved in the surface of the walls, and sometimes merely painted; and occasionally, it was both carved and painted. It was always most conventional, and certain details, such as the lotus and papyrus, were represented in the strictest geometrical arrangement, usually showing the bud, blossom,

and fruit in regular order, typifying the development of the entire plant.

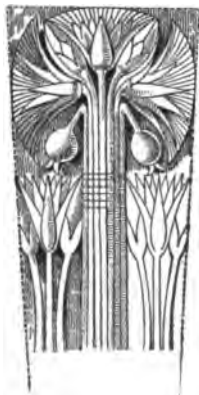


FIG. 19.

and is sometimes merely incised or outlined in the surface of the wall, as shown in Fig. 20. On work executed in a later period, the background is sometimes cut away,



FIG. 18.

In Fig. 19 observe the straight, stiff stem and trumpet-shaped blossom, the sharp-pointed petals of the calyx, and the geometrical arrangement of the entire plant, with all its distinguishing characteristics emphasized to produce conventionalism.

Egyptian carved ornament of this character is nearly always in low relief,

leaving the carved ornament and figures in full relief, as in Fig. 21.

This figure represents a statue of the queen, Cleopatra, upon whose head is supported, between the two horns of the sacred cow, the disk, emblematic of the sun. The head-dress consists of a representation of the buzzard, a sacred bird, whose head protrudes from the fore part of the head-dress, and whose wings reach down on each side, as though pro-



FIG. 20.



FIG. 21.

tecting the wearer. The panel or cartouch in the upper left-hand corner contains the hieroglyphic characters spelling the name Cleopatra. From this figure, a characteristic example of Egyptian ornament of this period, we can obtain a good idea of the contemporary head-dress, of the habit and method of wearing beads and necklaces, and, to a general extent, the cast of features and countenance of this race of people. It must be remembered, however, that these carvings are not always portraits, but symbolisms drawn to represent the characteristics of the person portrayed.

45. Decorative Ornament.—The third kind of Egyptian ornament, that which is purely *decorative*, is found mostly in paintings on the walls of tombs, on mummy cases and sarcophagi, on dresses and utensils.

46. The Egyptians believed in the immortality of the soul, and also that the soul would return after death and reoccupy the body; hence, they took every means to preserve the body in order that it should be in a fit condition for the reception of the soul at the time of its resurrection. Death was not regarded by the Egyptian as a great calamity, as he looked on his earthly life as a mere temporary existence during which he made elaborate preparations for the preservation of his body after death. This accounts for the massiveness and permanency of the tombs, some of which were the life work of those that expected to occupy them.

The body was embalmed with great care; a scarabæus was fastened to the breast, and the mummy wrapped in cloths or bandages bearing hieroglyphic inscriptions. In some cases, particularly with the wealthier classes, the mummy thus wrapped was placed in a wooden box, carved inside to fit the form, and generally shaped to conform to the lines of the body on the outside, as shown in Fig. 22. The box was then carefully sealed and the outside painted, or often gilded, and covered with elaborate and complicated hieroglyphs describing the life and deeds of importance connected with the earthly existence of the body within.

The mummy case was then deposited in the tomb, frequently in a standing posture, and the walls and columns, and other architectural details of the particular chamber



FIG. 22.

where the mummy was placed, were painted with rich ornament and inscriptions. The sarcophagus, or stone box, in which the mummy was sometimes placed, was richly ornamented both with painting and carving of the same general character as on the walls, and it is from examples of this kind that the following illustrations are taken.

In Fig. 23 is a painted wall ornament from the temple of Seti I, and it represents the *sacred bark*, the ceremonies connected with which were an exceedingly complicated but important branch of the religious devotions of the priests. This device frequently appears in the sculpture and paintings



FIG. 23.

of the tombs, and usually represents the funeral of one of the gods. Everything is arranged in a most orderly manner, as will be observed, and every detail is placed to convey a certain significance. It would be impossible here to go into all the explanations connected with Egyptian hieroglyphic ornament, and the illustration in Fig. 23 is given to show how completely the walls were covered with an illustrated idea.

47. The Fret.—Fig. 24 is a *fret* design, sometimes called a *labyrinth*, and is stated by some to have been suggested by the plan of a building known as the labyrinth that was erected in ancient Egypt about 4000 B. C. This was

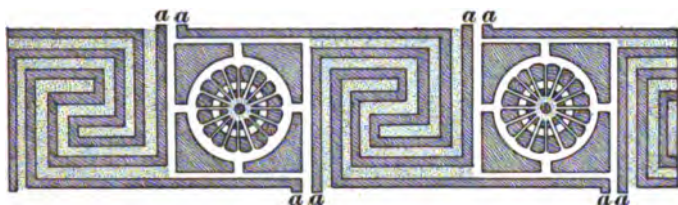


FIG. 24.

supposed to have been a very complicated structure of many hundred rooms, out of which it was practically impossible for one to find his way without the assistance of a guide. The rosette alternating with the labyrinth pattern was probably derived from the full-blown lotus flower. This ornament is found on many mummy cases, and is even used for surface decoration, for it can be repeated in any direction simply by continuing the lines, as shown at *a*, to form a new pattern above and below similar to this one.

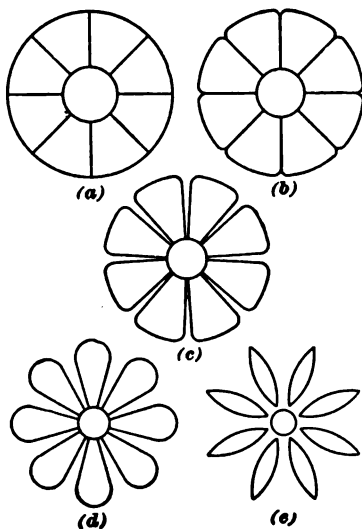


FIG. 25.

48. It may be said here that the rosette form shown in Fig. 24 is but one of many observed in Egyptian ornament. In Fig. 25 (*a*) is shown a simple circle with an inner circle, and the space between them is divided by straight lines into eight equal parts. The transition from this form to the form shown at (*b*) consists merely of a notching of the edge of the

outer circle where the lines intersect the circumference; (*c*) is the same as (*b*), except that the dividing lines are made in pairs, thus making each segment independent and by itself. From (*c*) to (*d*) the segments are made narrower, until they are very nearly the size of the spaces between them, and at (*e*) we reach the extreme limit where what might be considered the petals of the floral device are separated from the center and from one another entirely, and become independent elements of the design. Observe that the central circle has been becoming smaller in the evolution of the device from (*a*) to (*e*), and the design has worked itself from a purely geometrical form at (*a*) to a purely floral form at (*c*) and back again to a purely geometrical form at (*e*), entirely different from (*a*). This principle should be borne in mind, as it is of much importance in the tracing of the Egyptian style in European art.

49. In Fig. 26 is shown a border wherein the scroll is made use of simply as an ornament, in distinction from its character, as emblematic of the *waves of the Nile*. The lotus also appears at the springing of each scroll line, but, in this case, purely in a decorative sense, and in no way

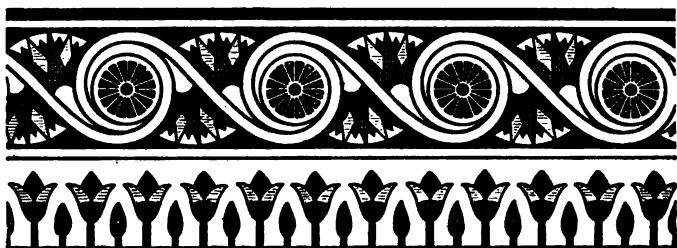


FIG. 26.

suggestive of a hieroglyphic record. Below is a stiff conventional row of lotus buds and blossoms, so arranged as to form a conventional border and a part of the design above, purely for decorative purposes. In the hieroglyphs, the symbol for the word *water* consisted of a simple jagged line

suggestive of waves, as shown in Fig. 27 (a). This symbol, when used under certain conditions, was indicative of the Nile also, and in some

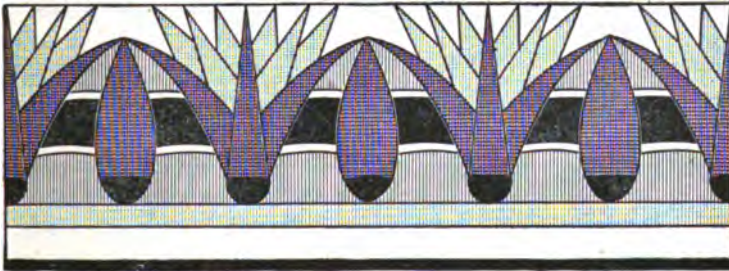


(b)

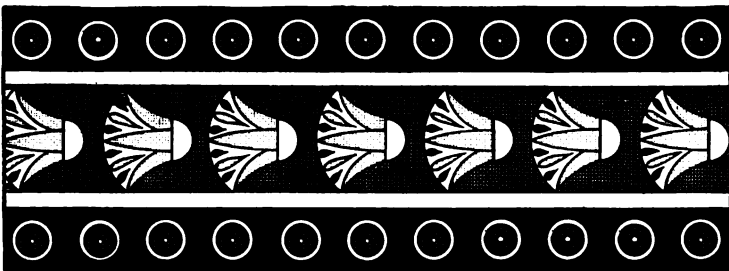
FIG. 27.

of the hieroglyphic ornament it is elaborated into what is called the *wave border* as shown at (b).

50. In Fig. 28 are shown two borders where the lotus is conventionalized, very much on the lines of Fig. 15. It is



(a)



(b)

FIG. 28.

used here purely for decorative purposes, and in Fig. 28 (a), where the side leaves of the flower intersect, a bud is

drawn in order to fill up the intervening space, while at (b) the flower is placed in a horizontal position and shows another application of the lotus to a border that requires little or no explanation, simply being the conventional rendering of the lotus blossom applied in repetition on the border of a wall surface, and completing the simple geometrical forms above and below.

51. Fig. 29 shows an application of the scroll without the lotus, while below is a simple serrated band, the type of

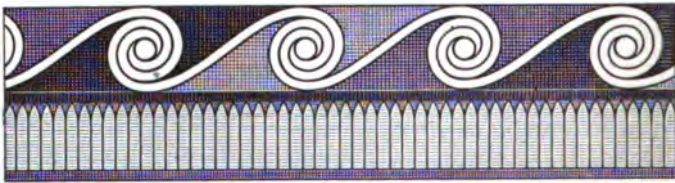


FIG. 29.

which is suggestive of the hieroglyphic representation of the Nile, though its derivation from this origin is by no means certain. These few borders show the immense variety of



FIG. 30.

detail that the inventive Egyptian secured from a few simple types. When he carried his design further, to make complete surface decorations, he did not complicate his designs by adding to them any new forms.

52. Fig. 30 shows a wall decoration from a tomb at Thebes. Here the scroll, similar to that used in Figs. 26 and 29, is applied as a repeating ornament in four directions, and, in the space enclosed between the lines of the scroll, conventional representations of the lotus petal are drawn, thereby simply suggesting the

existence of an idea of lotus origin. It is not a representation of the flower, nor is it intended to be; it is simply a wall decoration, the lines of which, though abstract, owe their origin to the Egyptian ever-present association of the Nile and the lotus with everyday details of importance.

53. In Fig. 31 we have a border, also taken from a tomb at Thebes, wherein the lotus is used in a most conventional manner, but, at the same time, not greatly removed from its original type. The border above and below is a simple rendering of bands varied sufficiently from one another to destroy the appearance of stripes in either direction, and at the same time so arranged as to blend with the whole general effect and not attract the eye to any certain point.

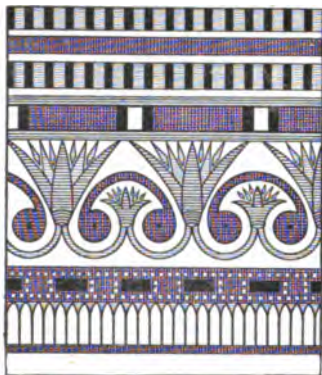


FIG. 31.

54. The Scroll.—The use of the scroll as a wall decoration, repeating only in two directions, is shown in Fig. 32.



FIG. 32.

Compare this figure with Fig. 30 and observe that the materials used to create the patterns are identical in both designs. We have the scroll and the lotus, and the lines of the scroll run from one end of the pattern to the other, and between the lines the space is filled with a design from the lotus. Notwithstanding this fact, could any two designs be more unlike? The fact that the

scroll lines in Fig. 32 extend and repeat only upwards and downwards, would tend to give the pattern the appearance of running in stripes vertically; this is, to a certain extent, offset by reversing the directions of the scrolls, giving each a letter **S** pattern, thereby preventing any vertical lines from appearing one over the other.

As an additional element to destroy this feeling of stripe, the coloring of the lotus flower has been so arranged that the darkest portions will all blend and give the appearance of stripes in a horizontal direction, although really no stripes exist there. Observe that in each reversed lotus flower, the horizontal line that cuts it off at the bottom of the petals is about on a level with the lines of intersection between the individual petals of the next flower, and this, continued, gives a dark stripe alternating with a lighter stripe, running in a horizontal direction throughout the pattern. This in effect destroys the vertical element. The same result is obtained in Fig. 30 by the changing of the direction of the figures. Each individual element of the design is placed at right angles to the one above and below, or to the one to the left and right of it; a feeling of continuity is thereby avoided.

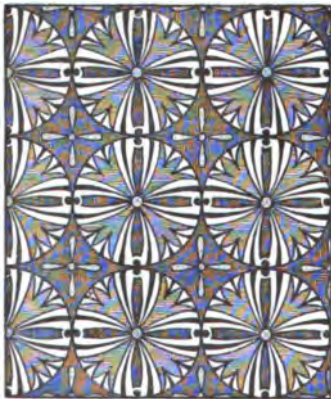


FIG. 33.

55. Another combination of lines based on the lotus is shown in Fig. 33, wherein the wall surface is divided by a number of circles, from the center of each of which spring four ornamental forms whose outline is based on the three outer leaves of the lotus. Another pattern based on a combination of the circle and

the square is shown in Fig. 34. The wall surface is covered with tangent circles, exactly as in the previous case, but from the centers of these circles spring four leaves in

vertical and horizontal directions, thereby suggesting rectangular forms connecting the centers of the circles. Other foliated forms, in the quadrants of the circles embraced by each pair of these leaves, outline the three petals of a lotus

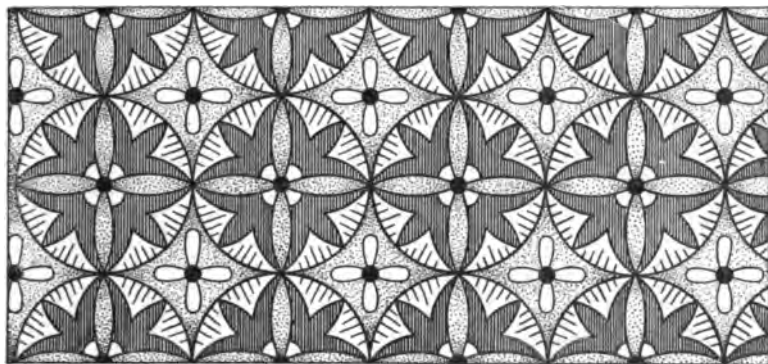


FIG. 34.

as before, in each quarter of the circle, while the spaces outside of the circumference of the circles are ornamented with a figure smaller than, but almost identical with, the one springing from the centers.

A careful analysis of Figs. 33 and 34 will again show that the elements, types, materials, and forms of both figures are as near identical as it is possible for any two patterns to be, and yet no two designs could be more unlike in appearance.

56. Referring now to Fig. 35, we have a wall decoration composed of the wave lines associated with the Nile, running in different directions. Trace any one of these lines out and you will

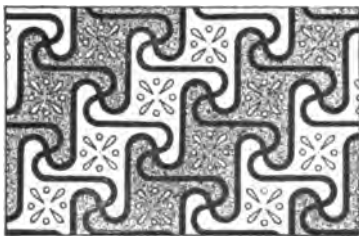


FIG. 35.

see that it simply runs across the pattern in a diagonal direction from top to bottom, or from bottom to top. The line that intersects with it runs practically at right angles

to it and intersects at every wave. The small irregular figures thus enclosed in the wave line are colored distinctly in alternate stripes, and a contrasting figure identical with the figure drawn outside the circumferences in Fig. 34 is then stamped in them.

57. Fig. 36 might be at first considered a double rendering of Fig. 35, but, strictly speaking, such is not the case. The heavy black lines of Fig. 36 in general direction run vertically and horizontally, and the spaces enclosed by each pair of verticals are painted alternate colors, the effect of

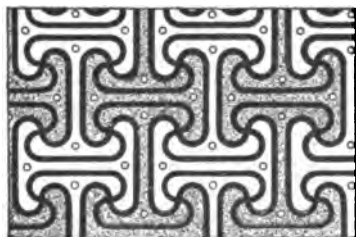


FIG. 36.

which is not to give that of stripes, but of a general blending of wall surface. Observe that the colored or shaded portions of the pattern are broad, alternating with a connecting link of narrow color, while opposite this connecting link, on each side, are the broad portions of the contrasting

color. A study of Fig. 36 in comparison with Fig. 30 will show that the effort to prevent continuity or the effect of a stripe is the same in each case, and the principle by which this appearance is prevented is identical in each case, though the patterns themselves are utterly unlike in principle, type, and manner of execution.

58. In Fig. 37, taken from a tomb at Thebes, we have a combination of the scroll and the lotus as the running elements of the design, and the scarabæus and lotus rosette as surface elements or inlays. In this design, five sets of scroll lines spring from each center, the two upper ones branching out to form the top of an enclosing panel and to form the continuity from one scroll to another, while of the three lower ones, one connects in a horizontal direction the two lower scrolls, and the other two serve to form a bottom of a panel and preserve the line of continuity to the scroll below.

Simple as this arrangement is, it illustrates the ingenuity of the designer. From every springing point, the three characteristic petals of the lotus flower are exhibited, while from the bottom of each pair of scrolls the spreading petals of the full-blown blossom are used to fill the space. In each alternate panel, both vertically and horizontally, the scarabæus appears in its characteristic hieroglyphic form, and in each alternate panel between is a rosette based on the lotus blossom.



FIG. 37.

59. It will be unnecessary to describe all the characteristics of the design in Fig. 38; the student will simply observe that the scroll here consists of but four springing lines, and these are apparently made to serve the same purpose as five in the previous case. The panels enclosed between the lines

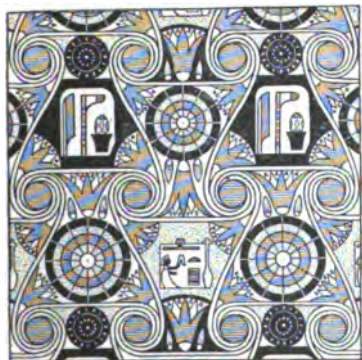


FIG. 38.

of the scroll are of a different character, and, though filled with devices similar to the ones in Fig. 37, the general appearance of the design is totally different. We have one element in this design, however, that differs from any of the previous ones discussed, and makes a portion of it belong to the second class of Egyptian ornament, heretofore described; that is, the hieroglyphic representation

of a fact, the little devices in alternate spaces being hieroglyphic writings descriptive of some of the acts and doings connected with the life of the person to whom the

tomb was erected. All this ornament was richly colored, and the effect of it on the walls was due as much to its system of coloring as to the design itself.

60. It is impossible here to express in each case, without means of color, the characteristic appearance of each design, but the main point is to exhibit the ingenuity and invention of the Egyptian artist in his portrayal of a multitude of different designs, all based on exactly the same idea, and using less than half a dozen different forms. In spite of their simplicity, a careful study of each one of the designs here illustrated will always bring forth a new point so subtle that, though when once discovered it appears most prominent, it has for a long time previous remained undiscovered.

61. Egyptian Coloring.—In general effect, Egyptian ornament was brilliant and many-colored. The reason for this must be borne in mind: the interiors of the Egyptian's temples and tombs were pervaded by a deep sepulchral gloom fittingly symbolizing the mysterious character of his religious belief, and, in order that the decorations on the walls should stand out amidst this gloom, it was necessary that the brightest of colors should be used, or the decoration would fade into insignificance.

While the Egyptian ornament may be said to be thoroughly polychromatic, there are many cases where it depended as much for its expression on carving as on painting. However, Egyptian ornament may be considered, in a multitude of cases, as being painted ornament. In their rendering, the Egyptians used no shades or shadows, and laid their colors in flat tints only; yet they found no difficulty in conveying to the mind the identity of each object they desired to represent, without a suggestion of shade or shadow.

62. The palette of the Egyptian artist contained seven depressions for seven colors, arranged in the following order: white, yellow, green, blue, red, dark brown, and black. There were two kinds of yellow—a bright yellow and yellow ocher. There were three kinds of blue—an azure blue, a

greenish blue, and a dark blue. The reds were made of burnt ocher, and the general tone of Egyptian ornament seems to have inclined more to yellow than to any other color. Green was used less than red, yellow, and blue. The Egyptian oriental blues are more greenish in hue than a strictly normal blue, and their reds partook of an orange tinge. They appreciated the fact that colors were affected much in their appearance when in juxtaposition to one another, and they made use of this detail to emphasize or detract from the strength of some particular hue.

ASSYRIAN ORNAMENT.

63. Development.—Although the early architecture of Western Asia is of little importance so far as its direct influence on the styles of later periods is concerned, it must be given a certain amount of consideration in order that the development and growth of certain subsequent forms may be properly understood under the different conditions.

64. The ornament of Assyria was probably borrowed from Egypt, as there are many points of resemblance in the two styles. The sculpture of the Assyrians seems to have been a development of that of the Egyptians, but descended from it rather than advanced in scale of perfection. Egyptian sculpture degenerated toward the end of the fourth century B. C., as it expressed an unnatural swelling of the limbs that was at first but lightly indicated and gradually became almost exaggerated—the conventional having been abandoned for an imperfect attempt at the natural. In Assyrian sculpture, the attempt was carried still further, and, while the general arrangement of a subject and the pose of a single figure was still conventional, an attempt was made to express the muscles of the limbs and the rotundity of the flesh to an extent that destroyed all conventionalism. In all art, this is a symptom of decline. Nature should be idealized, not copied.

65. Assyrian ornament is not based altogether on the same types as the Egyptian, but is represented in the same way. In both styles, the ornaments appear in relief, as well as painted, in the nature of hieroglyphic diagrams. With the exception of the pineapple, and the adaptation of the Egyptian lotus, Assyrian ornament does not seem to be based on any natural type, and the natural laws of radiation and



FIG. 39.

tangential curvature that we find in Egyptian ornament are, in the Assyrian, observed more as a traditional or borrowed idea rather than an instinct of the people themselves. Fig. 39 shows an example of Assyrian sculpture supposed to illustrate a scene where the king on horseback is hunting, attended by his servants and arrow bearer. *The pose of the figure and the character of the work is strongly suggestive of Egyptian origin, but the attempt to express in stone the muscular roundness of the limbs and other parts is indicative of a decline in art.

66. The Assyrian religion differed widely from that of the Egyptians, and, though their combinations of forms

resembled, somewhat, certain of the Egyptian deities, the style in which they sculptured them was below the standard of art and practice in Egypt.

Fig. 40 is an example of this work representing the winged deity Asshur, in which may be seen the excessive effort to



FIG. 40.

represent the rotundity of muscular developments. The attempt to represent the muscular characteristics of this figure is exceedingly inartistic, and, though the attempt to present an appearance of power and strength is well carried out, it is done with much less delicacy and refinement than we would expect if the work were an example of Egyptian art. Asshur was the supreme deity in the Assyrian group of gods, and in the conception of his form there is much that is suggestive of Egyptian origin. The hawk head and wings

are surely borrowed from Egypt, and the pose of the body and limbs is strongly suggestive of Egyptian ideas. The position of the hands seems to be repeated in nearly every example of Assyrian ornament where the figure represents a deity, and is similar to certain Egyptian productions of the kind, except that the limbs are clumsy and the molding possesses much less refinement.

67. In Fig. 41 is shown the Assyrian rendering of the Egyptian lotus, and, in fact, this border, which comes from

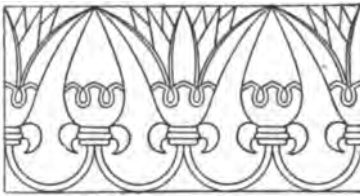


FIG. 41.

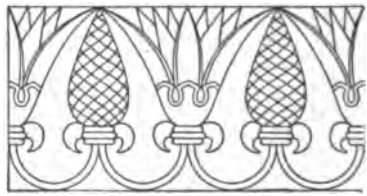


FIG. 42.

Persepolis in Assyria, might easily be considered an attempt to copy the example of Egyptian ornament shown in Fig. 28 (a). Fig. 42 shows another example of lotus ornament from the same city in Assyria, wherein the detail is almost identical with Fig. 41, but the lotus bud between the two blossoms is replaced by a device representing the pineapple—a fruit that was sacred in Assyrian art. The close resemblance of these forms to those seen in Egypt is almost indisputable evidence that they were derived from the latter country, and the rosette form shown in Fig. 43, while it appears frequently in borders of Assyrian orna-

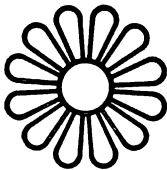


FIG. 43.



FIG. 44.

ment, must undoubtedly have been developed or adapted from the Egyptian device shown in Fig. 25 (d). A still

cruder adaptation of the Egyptian lotus to carved ornament in Assyrian work is seen in Fig. 44, wherein the surface of the petals is simply indented in a harsh, crude manner, and the outline is carved into seven pointed terminations of the leaves. The use of this ornament in borders, in combination with another crude ornament, is shown in Fig. 45, wherein the outline of the lotus-derived figure shows a little more refinement, as its lines are more gracefully curved, but where the connecting lines between it

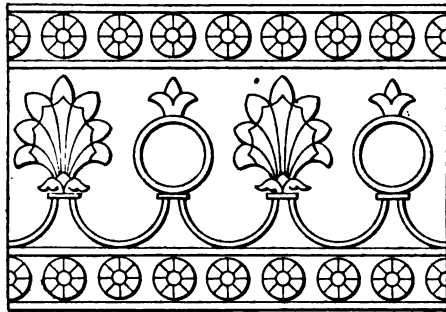


FIG. 45.

and the interposed device are arcs of a circle, making the entire composition crude and inartistic. The circular forms with the three-leaved blossom on top may be representative of pomegranates, the designs of which were used largely in Assyrian decoration. However, it is of little importance in itself what types were used in this art. The lotus and rosette were undoubtedly borrowed from Egypt; the latter, both as shown in Fig. 43 and modified in Fig. 45, are easily traceable to designs seen on the banks of the Nile.

68. These few ornaments will suffice to trace the art of Egypt into Asia Minor and show in subsequent styles how their altered introduction into European countries was able to harmonize with the style already existing.

CLASSIC ORNAMENT.

GREEK ORNAMENT.

69. Greece and Egypt Compared.—Before entering on the study of the characteristics of Greek ornament, let us for a moment compare the conditions and surroundings of Greece with those of Egypt. Although modern Egypt covers a considerable extent of country, ancient Egypt included only the section that bordered on the Nile. In fact, as we have already suggested, it may be considered simply as the country that was watered by the annual inundations of the Nile. The climate here was mild, there being but two seasons—spring and summer—and there was very little variety in the daily life of the inhabitants, except what may have been experienced in the celebration of some national or religious festival.

70. Greece, on the contrary, presents entirely different conditions. It is on the sea, and throughout its long broken shores, the tide ebbs and flows and penetrates far inland through the long clefts in its coast. Greece has many mountains, too, and this affected her climate inasmuch as they served as watersheds, carrying the rains down and fertilizing the valleys. The country, however, is far enough south to receive a tropical sun, and, although its climate ranges from severe cold in winter to a fierce heat in summer, the majority of the time its temperature is warm and comfortable.

71. Character of the Greeks.—The people of Greece were brave, active, and athletic; their Olympian games were world renowned. Their bodily culture was extremely fine, but did not compare with their intellect, which was more developed than that of any other nation. The Greek language is rare and complete in structure, and Greek literature is unsurpassed. The Greek religion was polytheistic, but the Greeks did not devote as much attention to the worship

of their gods as did the Egyptians. True, they erected vast temples and costly monuments to Athena, Apollo, Zeus, Erectheus, and other deities, and these temples, exquisite in form, proportion, simplicity, and perfect harmony, are examples of the finest architecture that the world has ever seen. Notwithstanding this mark of reverence to their gods, the Greeks did not embody into every branch of their art some detail or reminder of their religious duties and inclinations as did the artists of Egypt. The form of the Greek's worship was, in some respects, almost as complicated as that of the Egyptian, but his intellect seemed to be more advanced and he was bound less by a superstitious interest in the future condition of his soul, and his fancies naturally sought ideas that in themselves were beautiful to think of and to look at, rather than suggestive of gloom and forebodings concerning an uncertain future existence.

The development of Greek art then takes place along an entirely different line from that of Egypt, and though it goes as directly and intelligently to a point of climax, the resulting forms are totally different in their character, meaning, and influence on subsequent styles.

72. We have seen how the Egyptian artists derived their ideas for ornamental design directly from nature, that their types were few, and that they remained unchanged throughout the entire course of Egyptian civilization, except in the degree of perfection of execution; and, in this detail, the greatest perfection existed in the most antique examples.

We have studied that the Assyrian was a borrowed style and possessed no characteristics of an inspired art, but appeared to have been suggested by the art of Egypt, and that the suggestions borrowed from the Egyptian style were during its decline, and the Assyrian artist, instead of advancing on the style, carried that decline still further. With Greek art, however, we find a vast difference. It was undoubtedly borrowed from both Egypt and Assyria, but was developed in an entirely new direction, and, unrestricted by any complicated religious laws, as both Egyptian

and Assyrian art seem to have been, the Greek adoption rose rapidly to a high degree of perfection. Though the influence of Egyptian and Assyrian art can be traced in many details of Greek designs, those influences are entirely subordinated to the Greek feeling applied in their introduction. Neither the art of Egypt or Assyria can be considered to play an important part in the styles of subsequent generations, but the art of Greece pervades all subsequent history.

73. It must be considered, in the study of the Greek styles, that the remarkable development was due to their introduction into Greece at a critical period of the art development of that country. Greek art carried the perfection of pure form to a point that has never since been reached, and the abundant remains of Greek ornament compel us to believe that refined taste was universal, and that the country was overflowing with skilled hands and minds so trained as to enable them to execute these beautiful ornaments with unerring precision and truth.

The beauty of Greek ornament, however, lies almost exclusively in its *symmetry* and *form*. It is lacking in one of the greatest charms that should always accompany ornament, viz., *symbolism*; and, despite the pleasure we experience in its beautiful gradations of form and color, Greek ornament is meaningless, purely decorative, never representative, and in few cases it is, in the stricter sense, hardly even constructive.

74. Architecture.—In the architecture, the various members of a Greek monument presented exquisitely designed surfaces to receive ornament, which at first was simply painted and in later times carved and painted, but the ornament formed no such essential part of the construction as did that of the Egyptians. It could often be removed and the structure remain unchanged.

On the Corinthian capital (Fig. 50), the ornament is applied to the surface and is hardly constructed as a part of the capital itself. Remove the scrolls and foliated

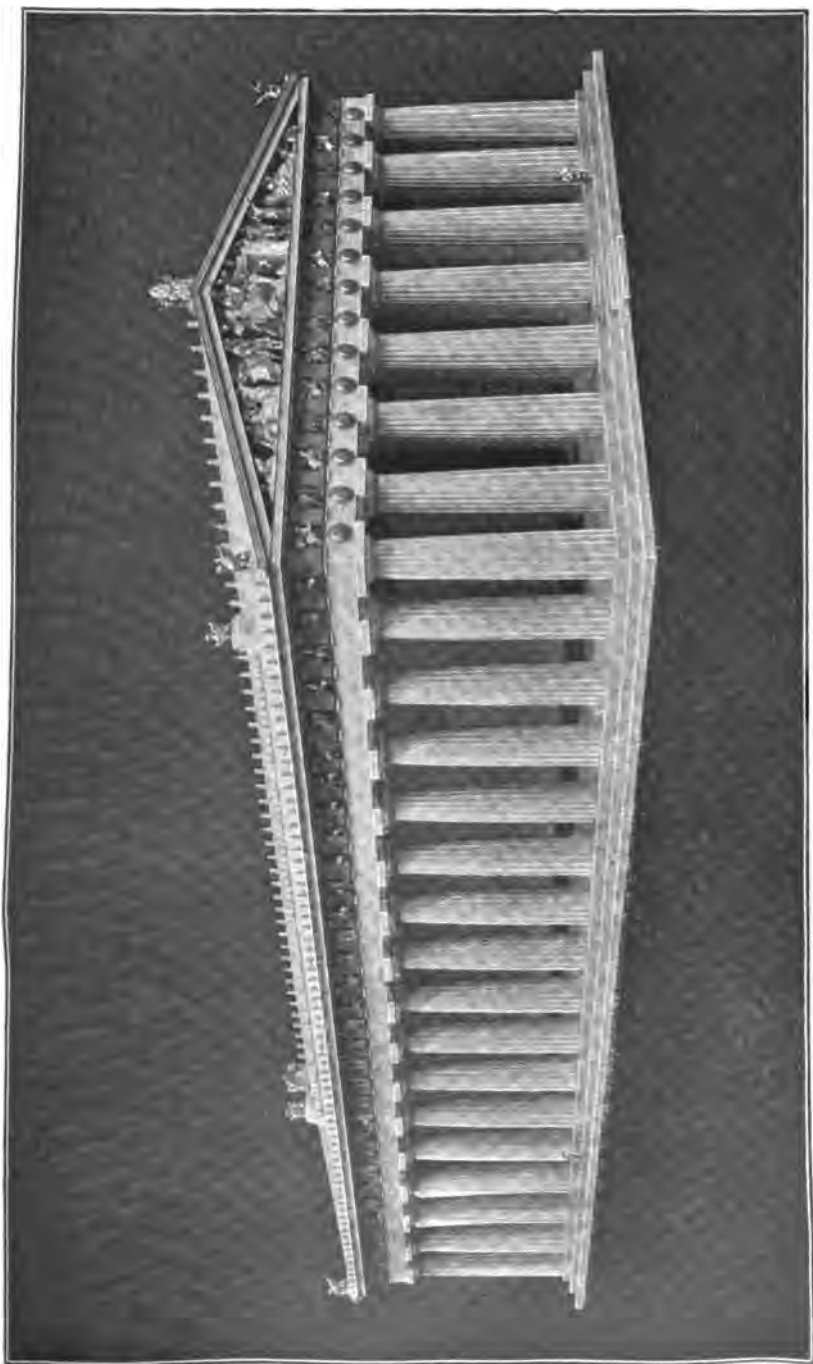


FIG. 46.

ornament and there still remains sufficient substance and material for the pier to carry out its purpose. On the Egyptian capital, however, Fig. 16, the whole capital is an ornament, and to remove any portion of it would be to destroy both the ornament and structural purpose of the column itself.

75. Sculpture.—In addition to the skill of the Greek artist as a designer, his unerring truth in the use of his chisel renders the work of the earlier periods remarkably interesting to us, but the monumental sculpture of the Greeks frequently went beyond the bounds of ornament. For instance, in the frieze of the Parthenon, Fig. 46, though composed of a series of groups of draped figures, the ornament was so far above the eye that it became a mere diagram—an ornamental band around the top of the building, the beauties of which are simply astonishing when observed more closely. Every detail of each of the panels was as minutely wrought as though it were to receive the closest inspection. The folds of the garments and the molding of the limbs, even on the side away from the eye, that could never be seen unless the panel was removed from the monument itself, are as carefully modeled as those most prominently in sight.

Conscientious as this treatment may appear to be, systematic and honest as is the execution of a design that was dedicated to one of their gods, we are bound to consider this an abuse of means as a work of art design, and that the Greeks were, in this respect, inferior to the Egyptians, whose system of broad conventionalized ornament for monumental sculpture served its purpose to better effect.

76. Representative Types.—The examples of Greek representative ornament are few. In the earlier wall painting, there is a wavy ornament—a fret, somewhat similar to the Egyptian, used to distinguish water from land—and a few conventional renderings of trees, but nothing of importance was done in this line in the later history of Greek art. In the decorative ornament of the Greek vases, however, there is abundant material to assure us that we have examples

of every type of Greek ornament in all its phases. The types are few, but, in their conventional rendering, are so far removed that it is difficult to recognize any attempt at imitation. An examination of the wall paintings and vases leads to the belief that the forms of the leaves of the Greek flowers are due more to the limitations of brush work than to any direct imitation of the natural flower.

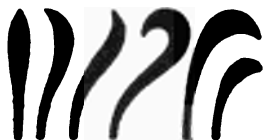


FIG. 47.

The six forms shown in Fig. 47 constitute about all the leaf strokes that are found throughout Greek ornament, but these six forms were applied to a variety of purposes, the extent of which is almost past belief.

77. The Three Great Laws of Nature.—That the Greek artists carefully observed the principle on which certain plants grew, and carried that principle out conscientiously in the execution of their designs, cannot be doubted. They were close observers of nature, and although they did not copy or attempt to imitate or make true portraits of any natural forms, they never violated a natural principle. The three great laws of nature—*radiation from the parent stem, the proportionate distribution of areas, and the tangential curvature of the lines*—are always obeyed; and it is the unerring perfection with which they are carried out in the most humble works, as well as those of the greatest importance, that fills us with astonishment at the conscientious scruples of the Greek artist.

Before we analyze examples of Greek ornament, we must first consider the architecture. The Greek, like the Egyptian, spanned his architectural opening with a lintel, and though the width of the opening was, like that of the Egyptian, governed by the length of the lintel that could be conveniently quarried, the Greek's knowledge of statics and his highly intellectual mind rendered him more inclined to develop artistic proportions, between the support and the material supported, than is found in any Egyptian work.

78. Orders of Design.—As before stated, the capitals of the Egyptian columns were of but three styles—the lotus bud, the lotus blossom, and the palm. These were varied more or less in different localities, but all being the development of a single principle, can hardly be called different orders of design from one another. In the Greek, however, we have three distinct **orders**, or systems, of design, the distinguishing characteristic of each being the capital of the column; these orders

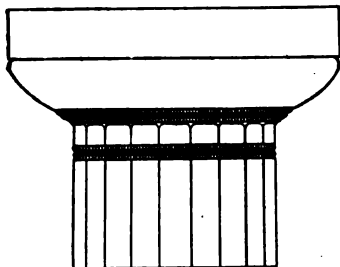


FIG. 48.

are the **Doric**, whose column is topped with a capital consisting of a simple slab over a thumb-shaped molding, as shown in Figs. 46 and 48; the **Ionic**, whose capital consists of a pair of scrolls, or volutes, supported upon a thumb molding similar to a diminished form of the Doric, as shown in Fig. 49; and the **Corinthian** order, Fig. 50, whose capital has been before referred to. In the last named, the top of the column is swelled out into a bell shape, not unlike the palm column of Egypt, but is decorated with leaves and vines and scrolls, and other forms based on types from the vegetable world. The volute, or scroll, of the Ionic capital some authorities endeavor to trace back to the lotus blossom;

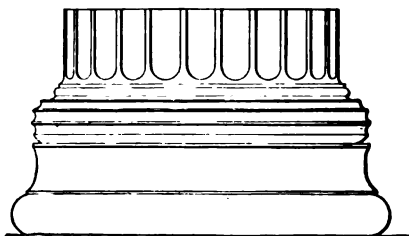
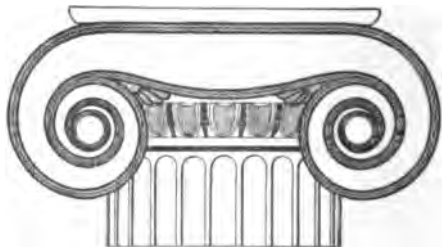


FIG. 49.

other authorities claim that its origin is in Assyria or Persia, certain forms of column there being treated with the scroll. However, it matters little whence came the idea, inasmuch

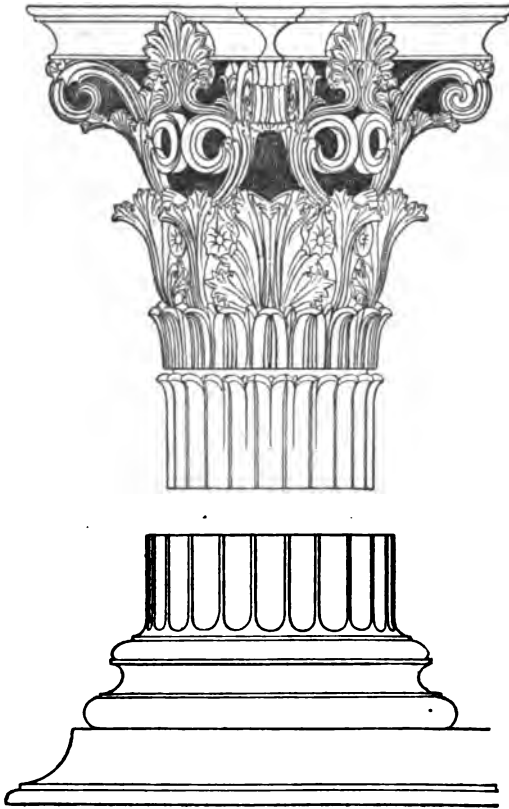


FIG. 50.

as it is so elaborated as to bear scarcely any resemblance to its original type. The bottom, or foot, of each of these columns differs somewhat from the Egyptian type also.

79. Bases.—It will be remembered that the Egyptian column was usually rounded off so that it was smaller at the bottom, and painted or carved, representative of the root of a growing plant. The Doric column sits flat on the ground

or plinth without any molded base whatsoever, and its sides are cut in channels, or grooves, each pair of which meet in an edge, or arris, that extends all the way to the capital. These may have been derived from the reedings of the Egyptian columns, imitative of the reeds of the growing plant. In fact, it has been practically conceded by nearly all authorities that the Doric column is a development of a certain form of Egyptian column; but, as said before, though the Greeks borrowed ideas from the Egyptians, they carried them to a higher state of perfection, and in nothing is this more evident than in the columnar elements of their architecture.

The bases of the Ionic and Corinthian columns are regularly molded, and though it is difficult to trace any direct origin to the system of moldings that appear so uniformly on these bases, it is simply necessary to bear in mind the fact that, in the three orders of Greece, two of the columns possess bases, and one of them—the Doric—is without that detail. The mathematical proportions of these orders we will consider later, when we can compare them with their Roman modifications.

80. Classic Moldings.—In Greek architecture all of the moldings are profiled on the curve of some conic section.

Before analyzing the outlines of these Greek moldings and the methods of contouring them, let us first give our attention to the conic sections from which they seem to have been derived.

81. In Fig. 51 are shown two similar cones abc and ade , which are in contact with each other at their vertexes a , and whose bases bc and de are circular and at right angles to the axes af and af' . If either of the cones be intersected or cut by a plane, which is parallel to one of its elements or sides, as be , the line of intersection will be a *parabola*, as at ghi ; but, if, instead of being parallel to the side be , the cutting plane makes an angle with it, the curve formed by the intersection will be either an ellipse or a hyperbola,

according to the angle. It will be an ellipse when the cutting plane is more nearly parallel with the base of the cone than it was in the case of the parabola, and passes through both sides as at jk ; and the line of intersection will be a hyperbola when the cutting plane is more nearly perpendicular to the base than it was in the case of the parabola, as shown at lmn and opq .

82. In the case of the hyperbola, the plane will always cut both cones, thereby giving two branches to the curve, and these branches will be farther apart as the cutting plane recedes from the axes of the cones. The nearer the plane approaches the axes of the cones, the straighter will become the sides of the intersecting curve, and as the plane

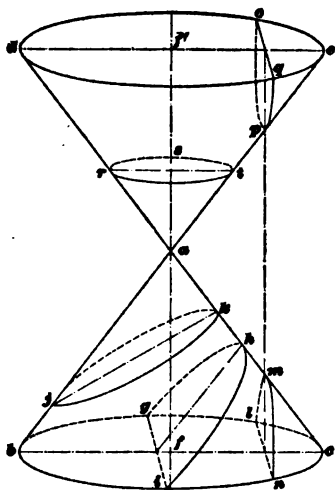


FIG. 51.

recedes from the axes, the rounder and nearer circular will be the intersection, though no matter how closely the curve of intersection may approach the arc of a circle, it can never become absolutely circular in form.

The hyperbola becomes two intersecting straight lines when the plane passes through the vertex; these two lines are most divergent when the plane is parallel with the axes of the cones, and gradually become closer together as the plane approaches a position parallel with the side of the cone, where the hyperbola reaches its limit in a straight line. This straight line is the common limit of both hyperbola and parabola, as any deviation from it will produce one or the other of these curves, according to the direction of that deviation.

83. As the plane of the ellipse becomes more nearly parallel to the base of the cone, the ellipse approaches the

form of a circle, which it finally becomes, when the axis of the cone and the cutting plane are perpendicular to each other, as at rst , and as the plane of the ellipse approaches the vertex of the cone the ellipse diminishes in size until it reaches its limit in a point. From a point to a circle, then, is the limit of curvature of the ellipse.

84. In *Geometrical Drawing*, methods are given in examples 23 and 25 for drawing an ellipse and a parabola of any desired proportions, and it is only necessary to add here the method of contouring the hyperbola.

To draw a hyperbola of a given width and height, the axis ab , Fig. 52, is laid down perpendicular to the width cd , in the same manner as for the parabola, and the rectangle $cdfe$ is constructed with cd equal to the base of the hyperbola,

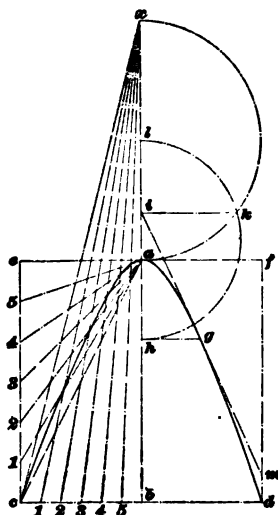


FIG. 52.

and the height ce equal to the axis ab . Divide one half the base and also each side into any number of equal parts, and connect the points of division on the sides with the vertex a by means of the lines $a1, a2, a3$, etc. The points of division on the base are connected by lines to some point x on the line of the axis ab extended; the points of intersection of these two series of lines will determine points on the hyperbolic curve, taking the lines in the order as they recede from point c ; x can be at any distance above a , and the curved lines ac and ad will approach more nearly the curves

of the parabola as the point x becomes more remote. On the other hand, the nearer the point x is to the vertex a , the more ac and ad will approximate to a straight line, and when points x and a coincide, the line ac will be a straight line.

85. To draw a tangent to any point of the hyperbola, first draw a line from the desired point g perpendicular to the axis ab , and on the extended axis ax , describe the semicircle akx , with a radius la equal to $\frac{1}{2} ax$; then, with a radius equal to $\frac{1}{2} lh$, describe the semicircle lkh intersecting akx at k ; draw ki perpendicular to ax , and connect ig ; then igm will be the tangent required.

86. There are, generally speaking, eight moldings used to separate different members and surfaces from one another, and these eight are shown in Fig. 53. The *fillet* A is simply a square-edged band used to separate individual members of a group of moldings. The *cyma recta* B is more commonly known as a crown molding, as it is used in the uppermost portions of a composition; at C is the *cyma reversa*, the contour of which is the direct opposite of B ; at D is the *cavetto*, or hollow molding; at E is the *echinus*, or egg-shaped molding; at F is the bead,

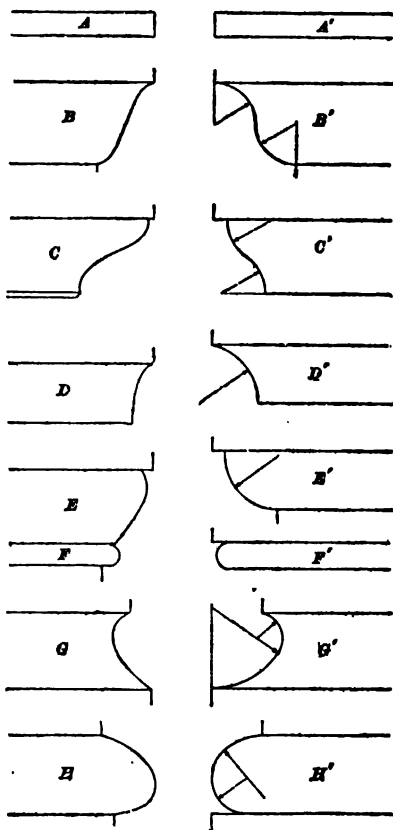


FIG. 53.

a small molding similar in use to the fillet, but with a round, instead of rectangular, section. At G is the *scotia*, the contour of which is practically the reverse of the echinus; and at H is the *torus* molding, used almost exclusively around the bases of the columns, as shown in Figs. 49 and 50,

wherein the bases of the Ionic and Corinthian columns each consist of two torus moldings, separated by a *scotia* and *fillets*. In Fig. 48, the principal molding at the top of the Doric column, it will be observed, is the echinus. The application of the other moldings will be discussed as examples of them occur.

87. Doric Order.—As seen in the illustration of the Parthenon, Fig. 46, there is little carved ornament in the Doric order, except such as appears in the sculpture of figures and animals, and, though in the Ionic order there are a few examples of relief ornament, it is in the Corinthian order we find the greatest relief and broadest demonstration of surface work.

88. Ionic Order.—In Fig. 54 is shown a frieze from the principal Ionic temple in Athens, the Erechtheum, the

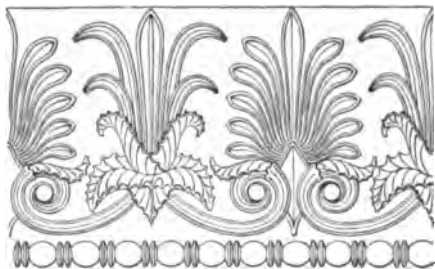


FIG. 54.

style of which is typical of this class of relief ornament throughout Greek design. It is plainly a development, in relief, of the brush forms shown in Fig. 47; and the addition of scrolls at the bottom, and leaves, from which the forms appear to

spring, is due to a conventionalization of the acanthus leaf, which first makes its appearance in art through its introduction into Greek architecture.

89. Corinthian Order.—In Fig. 55, however, is shown a section of ornament from the choragic monument of Lysicrates at Athens. This is the principal structure of Greek origin designed in the Corinthian order. Fig. 55 is an ornament from the top of the above monument, and shows not only the elaboration of ornament characteristic of this order, but also a principle of ornamental design that is of the

utmost importance in its relation to the lack of invention of new forms and the restraining influences of certain art periods. It will be observed here that the various parts of



FIG. 55.

the acanthus scroll grow out of one another in a continuous line. This is a principle of design that originated with the Greeks, and was continued by the Romans, after which, as we shall see, it was abandoned, and the abandonment of this simple principle was sufficient to generate an entirely new order of forms and ideas.

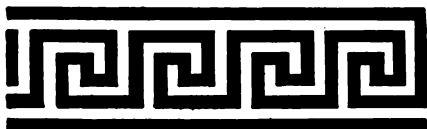
In Fig. 56 is shown a form of the acanthus leaf taken from the Tower of the Winds at Athens. It is purely conventional in form, possessing a broad, bold treatment, necessary for its execution in stone, and following closely the principles of the growing plant, as do all other developments in Greek ornament.



FIG. 56.

These few examples of Greek constructive ornament are most important just now, as they contain the principles from which certain later forms were developed, though they are of no great importance in subsequent history, except so far as they were developed and extended by the more voluptuous though degraded art of Rome.

90. Surface Ornament.—Of the surface ornament, purely decorative in character, we have a great variety in Greece, though all of it is based on a few simple types, and restricted almost entirely to variations of the brush forms shown in Fig. 47. The first exceptions to this, however, are the fret forms used extensively both in the architecture and



(a)



(b)

FIG. 57.

ceramics, of which Fig. 57 (a) and (b) are typical examples. The meandering line of Fig. 57 (a) is continuous and forms the entire pattern, while in (b) the pattern is composed of two lines that are carried through the fret parallel, to its center, where they cross each other and retrace their steps out of the labyrinth.

91. In Fig. 58 is a portion of a repeating border consisting of a number of brush strokes in the form of a *palmette* or

anthemion, and then enclosed in a single stroke, by which it is joined to a repetition of the same form. This is typical in certain classes of Greek pottery, and is usually executed in a reddish color on a black ground.

92. Anthemion.—The anthemion is one of the most characteristic of Greek forms. It exemplifies most perfectly the beauty of radiation, of tangential union, and of the proportionate distribution of areas. In Fig. 59 is shown at (a) an ornamental form occasionally met with in the earliest examples of Greek work, whose identity can be readily traced back to the lotus by comparison with Fig. 15 (a). The Greek development of this form into Fig. 59 (b) is not hard to comprehend. The radiating leaves are made larger and fewer. The calyx, from which they spring, is diminished to a couple of conventional



FIG. 58.

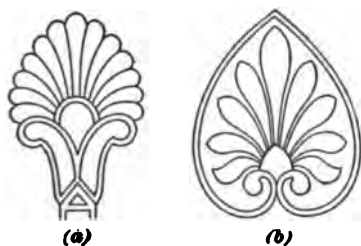


FIG. 59.

scrolls, and a sweeping outline encloses the whole device. The figure is sufficiently like that in the design shown in Fig. 58 to establish the origin of the latter; and, in fact, numerous cases of the application of the anthemion or palmette ornament, both in sculptured and painted work, will be met throughout the study of Greek art.

93. Greek Lily.—In Fig. 60 is shown another pattern where the palmette is formed of brush strokes in black upon a reddish ground, with a form somewhat resembling the Greek lily between each pair. The palmette form in this figure is rather more densely drawn than the anthemion in

Fig. 58, and is representative of the class of ornament usually termed the *Greek honeysuckle*. The conventional form between these anthemions just referred to—the Greek



FIG. 60.

lily—is traceable back to the old Egyptian lotus form, as are many other Greek details.

Fig. 61 shows at (a) an outline form of the lotus seen in many of the hieroglyphs. Variations of the form shown at (b) are seen in both Egyptian and Greek work, while at (c)

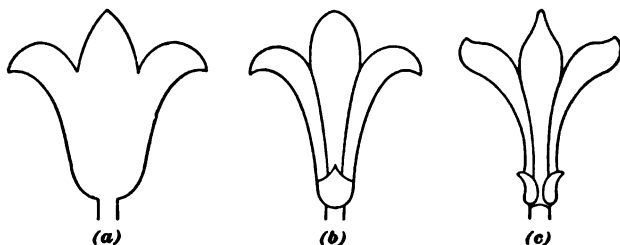


FIG. 61.

is the brush-stroke device, usually distinguished under the name of the *Greek lily*.

The foliated form between the palmettes in Fig. 60 is undoubtedly an adaptation of the lily to fit around the brush strokes of the intermediate figures, and the reaching of the outward leaves back toward each other is suggestive of the treatment of the lotus flower, both as used in Assyria, Fig. 41, and in Egypt, Fig. 28 (a).

94. In Fig. 62 we have a rosette pattern, repeated at intervals in reddish color on a black ground, that is almost undoubtedly of Egyptian origin, as shown in Fig. 25, although its development on a similar line of thought may

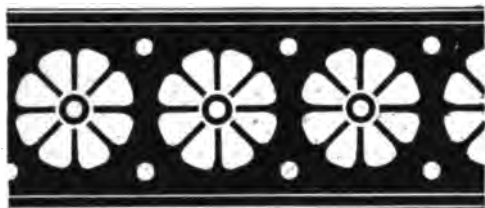


FIG. 62.

have been reached in Greek art. It is painted around the necks and bases of many vases, however, and is used so much in Greek ceramics that we associate it very largely with that style of art.

95. Fig. 63, another pattern undoubtedly of Egyptian origin, brings us to the consideration of the scroll in the surface decoration of Greek work. This pattern must certainly have been borrowed from the symbol of the Nile seen



FIG. 63.

in the Egyptian hieroglyphs, and though there has been little change in the idea, we find a refinement of its proportion and lines, and an improvement in its details from an art standpoint, even though it has lost all its symbolic character.

96. Fig. 64 is another adaptation of an Egyptian idea, as may be seen by referring to Fig. 26, wherein the scroll is

repeated as growing out from a device of the same kind, and a foliated form, slightly suggestive of the lotus, fills the space between each pair. The rosette, similar to that shown in Fig. 62, is also used as a termination of this scroll, and



FIG. 64.

this combination of the scroll growing out of the scroll and terminating in a rosette or flower, is of vast importance in Roman art, although on this simple vase border is the first place we find it among the Greeks.

97. Gulloche.—In Fig. 65 is shown an interlaced ornament used almost entirely in carved work on the *torus moldings* at the base of a column. It represents, supposedly, the woven bands around the bottom of a shaft composed of

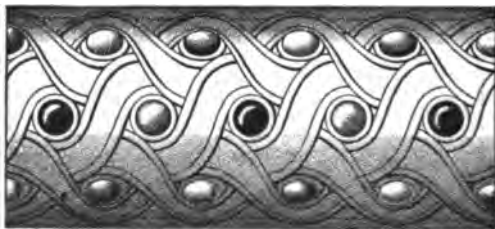


FIG. 65.

a bunch of reeds, and serves to bind them together. The name of the ornament is a **gulloche**, and different forms of it, varying in complexity, are found throughout Greek art.

98. Fig. 66 shows examples of *raised* or *relieved* ornament, as seen in the details of the temple of Athena Polias,

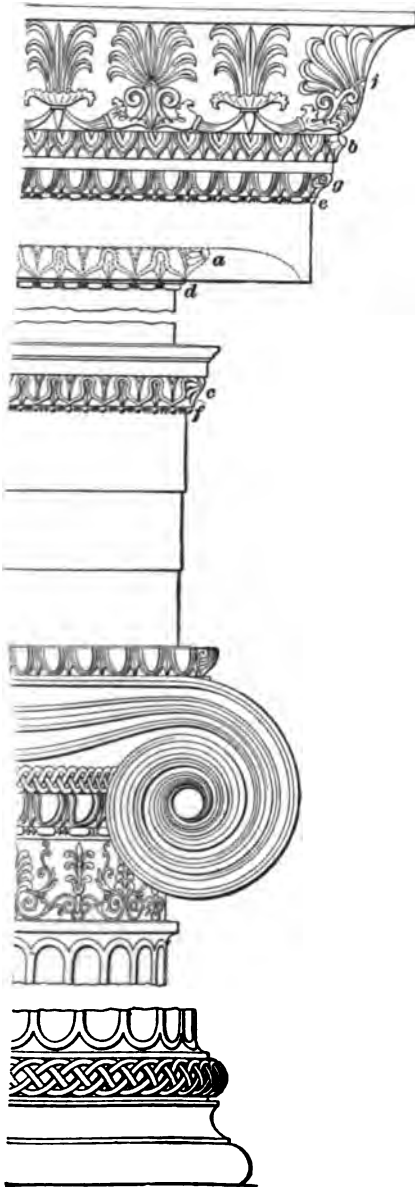


FIG. 66.

in the Erechtheum at Athens. The enrichment on the cyma recta *j* is the lotus-flower ornament, and is carved in very low relief; that is, cut so as to be raised slightly above the surface of the molding, and not sunk into it, as was customary with the Egyptians (see Fig. 20). As we examine later monuments of Greek architecture, we find the relief of the carvings increasing, until, when we reach the Greco-Roman period, the stems and stalks are in many instances so under-cut as to be almost clear of the molding.

The waterleaf carving on the cyma reversa occurs three times in this entablature, and is of varied form, according to its location. Up under the corona at *a*, where the shadow is deep and dark, the waterleaf is cut broad and bold, but immediately below the cyma at *b*, and above the upper fascia at *c*, the lines of the leaf are drawn longer and narrower, so that the moldings appear in more

delicacy of outline, where the full strength of the light strikes it. The same thing may be said of the bead moldings under the corona at *d* and under each of the two lower cymæ reversæ at *e* and *f*. The one in the shadow of the corona, as at *d*, is cut into long beads, while the one above the corona, as at *e*, is divided into much more minute divisions; and the one on the top of the upper facia, as at *f*, being in the strongest light of all, is turned into forms where the *bead* is simply a tiny sphere between two pairs of disks of the same diameter. The egg-and-dart ornament of the ovolo occurs here above the corona of the entablature at *g* and under the guilloche and volutes of the capital, the only difference in these two examples being that the one above the corona is carved upon a straight ovolo extending along the top of the corona, while the other is carved in the circular echinus surrounding the top of the column. The honeysuckle ornament cut on the neck of the column is in low relief, the same as that upon the crown molding *j*. The guilloche immediately under the lines of the volute is carved as a thin strap, loosely braided, around the top of the column, and the same ornament is cut on the upper torus of the base.

99. Polychromy is the term applied to the ornamentation of sculptured and architectural works by means of colors. In ancient buildings these colors were made to cover both flat surfaces and architectural details, while in statues or individual portions of the human figure and drapery, and in other products of plastic art, separate features of a sculptured ornament were colored in a manner characteristic of the subject.

Egyptian polychromy, on columns, bases, capitals, entablatures, wall spaces, and, in fact, almost everything of an architectural character, expressed itself in a series of highly colored designs in low relief, consisting mostly of figures and hieroglyphs, and often of purely decorative ornament.

In Greek architecture a complete system of color had been developed at an early period, particularly as applied to Doric

temples, upon numerous remains of which traces of this coloring are distinguishable.

The principal use of color in architecture is to bring out decoration. Surfaces may be relieved by a rich play of color without actual relief, and ideas may with facility be expressed by colors, when the object they embellish calls for the widest possible range of imagination and fancy. Still, color has its own province, and to a certain extent its own series of forms, and must therefore be treated in its own manner. A harmonious interplay of colors, with correct proportion in the distribution of each, is characteristic of a fine work of art. In truly artistic periods, color has never been made use of to produce artificial shadows or to bring out artificial depths and reliefs; nor has it in any way been employed as a makeshift for them.

100. Figs. 67 and 68 show a number of examples of Greek painted ornament in which the fret and the lotus and honeysuckle ornament are both prominent. Red, yellow, blue, and green were the principal colors used by the Greeks in these decorations, but they were so toned down and softened that the glare and harshness of such brilliant colors were blended into one delightful monotint as one viewed their structures from a distance. Fig. 67 is a portion of the capital,

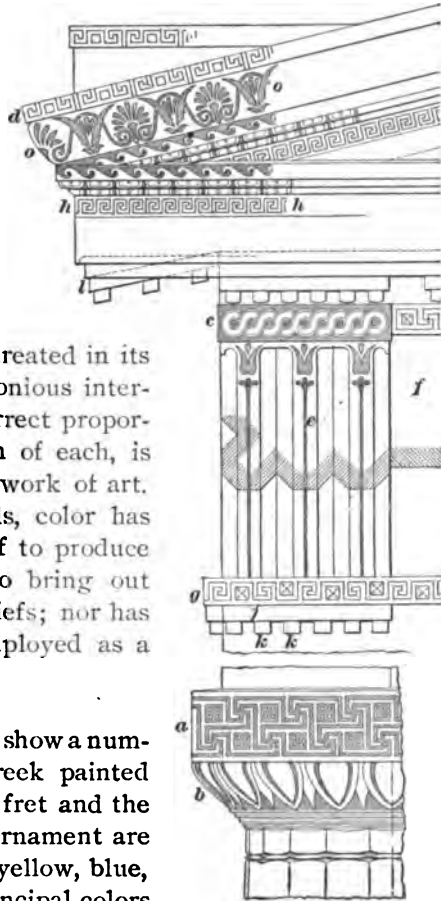


FIG. 67.

entablature, and pediment of the Greek Doric order, with the characteristic polychromatic ornamentation. The fret-work on the abacus at *a* was usually executed in a dark red or black, while the groundwork was pale yellow or orange. The egg-and-dart ornament on the echinus of the capital *b* was generally printed in red on a dark-blue ground. The triglyphs *c* were nearly always blue, and any ornament *e* on them was executed in red. The metopes *f* were generally red, and the sculptured figures with which the metopes were ornamented were painted in tints that represented the color and texture of their garments.

The fret drawn on the *tænia*, or fillet, *g* and those on the corona and epitithidas, as at *h* and *d*, were usually executed in gold, though occasionally in red. The *regulæ* *j* were blue with red drops, or *guttæ* *k*, as were also the *mutules* *l*, but the soffit of the corona *m*, shown in Fig. 68, was red. The small moldings *n* forming the finish to the corona were generally painted in light colors, such as red and blue, with spaces of white alternating between. The honeysuckle

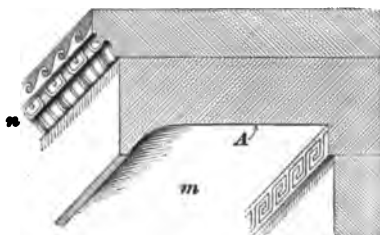


FIG. 68.

or lotus ornament, usually found on the *cyma recta* or *ovolo* *o*, shown in Fig. 67, when either was the top molding of the pediment, was carefully outlined in gold, and was always drawn very lightly and delicately when used to embellish this top member of the entablature.

101. In Fig. 69 we arrive at a more complicated pattern of the honeysuckle ornament, taken from the temple of Theseus at Athens. In this example, the palmette forms, composed of nine brush strokes, were executed in green, and the scrolls and connecting fine lines between members of the pattern were worked in gold. The intermediate blossom between the palmettes, or conventionalized floral form, was in red, and the whole executed on a creamy

ground. The effect was naturally very brilliant, the red and green colors standing out very sharply on the creamy ground, and contrasting beautifully with each other.



FIG. 69.

In their colored ornament, the Greeks appreciated the strengthening effect of placing one color beside another, and in much of their work made use of this combination of red and green on account of its superiority of effect.

In Figs. 70 and 71 are two panels taken from the ceiling of the Parthenon. While these at first seem somewhat sim-



FIG. 70.

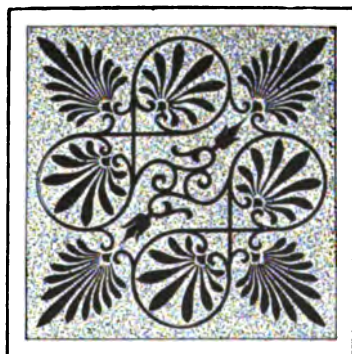


FIG. 71.

ilar in appearance, and though both are plainly executed with purely brush forms, a second examination will show

that they are entirely different as a whole, and unlike in their detail, except the form of their individual strokes. The lines of the pattern itself were executed in gold, that of Fig. 70 being on a red ground with a blue border around it, while the pattern in Fig. 71 was on a blue ground with a red border. This difference of coloring emphasized not only the difference in pattern of the two panels, but, at the same time, clearly marked the dividing line between them.

102. In Fig. 72 is shown a frieze ornament wherein the entire design is executed in the contrasting colors of red and green on a ground of cream. The central stroke of the honeysuckle ornament and of the figures on each side are



FIG. 72.

green, and each alternate brush stroke from them is green also, with intermediate strokes of red. The generating line, which encloses the honeysuckle ornament and curves into the base of the intermediate figure, is green,

but the triangular stroke at the base of the honeysuckle is red. This design, like the two previous ones discussed, is dependent entirely on the limitations of brush work for the character of its form, while the contrast of color in the different strokes of its composition gives to the design the brilliancy of effect in no way obtainable in a pattern executed in a monotint.

103. Antefixæ.—Referring back to Fig. 46, it will be observed that all along the edge of the roof are a number of small vertical ornaments. These are *antefixæ*, and are so placed to close the end of each row of tiles with which the roof was covered. Though they were carved in marble, and designed to fit the end of the tile, they were modeled after the palmette, whose characteristics were governed, as is so much other Greek ornament, by the capabilities of the brush stroke.

In Fig. 73 is shown one of these antefixæ, the scrolls and vertical strokes of which were green, and the space between the two scrolls and each alternate stroke above them were painted red.

104. Endless examples could be recalled exhibiting one or more of the numerous characteristics of Greek ornament, but, like the Egyptians, their types were few, and it is the repetition of a single idea, or its combination with not more than one other idea, that lends what variety there is to Greek ornament. There are one or two forms used in later art that undoubtedly had their origin on Greek soil, but they were developed to so much greater extent in a later period that their details will be considered in the later style.



FIG. 73.

ETRUSCAN ORNAMENT.

105. The Etruscans were a people inhabiting the middle part of Italy from a period of most remote antiquity. It is probable that they came originally from the same Asiatic race as did the Greeks, and their occupation of Italy seems to date from about the same period as the settlement of Greece. Their language has never been translated, however, and we therefore have no written history to verify this belief.

106. In the settlement of Rome, the Etruscans played an important part. They were a highly artistic people, while the early Roman was a warrior and had no art taste whatever. The Etruscans introduced the arch into the constructions of public utility, and in that way it found a place in the architecture of Rome. Besides their skill as builders, the Etruscans were particularly deft in ceramics and goldsmithery, and, though the character of their designs bears a strong

resemblance to those of Egypt and Greece, their style was unique, and was developed on independent lines. In designs and workings for jewelry, they were original and skilled, and Etruscan jewelry was much sought even in artistic Greece. Under their skilful hands, every conceivable object was worked into the design. Flowers, fruits, figures, vases, cornucopia, rose work, crescents, ellipsoidal balls, and chains of all sorts and sizes found a place in their jewelry designs.

They used the emerald a great deal more than any other of the precious stones, on account of a superstition that it possessed medical qualities, but pearls, glass paste, cameos, and intaglios were used also, and the variety and taste in this line of ornament exceeded that of any other nation.

107. There are many objects of Etruscan design that are still considered masterpieces of art; and diadems, crowns, necklaces, ear drops, bracelets, hairpins, and rings are still designed on the lines originated by the Etruscan goldsmiths. Scarabæi are very frequently introduced in these designs, and are sometimes used as a link to unite two parts. In fact, this device appears so frequently in their jewels, utensils, sword hilts, etc. that it would appear probable that the



FIG. 74.

Etruscans worshiped this insect, or associated it with some superstitious idea. The scarabæus of the Etruscans differed materially from that of the Egyptians, inasmuch as it was usually carved of precious stone, or metal, whereas the Egyptian device was most frequently painted, though many of them were worked in metal and worn as rings and jewelry.

108. In Fig. 74 is shown a necklace, the centerpiece of which consists of an elaborate piece of goldsmith's work, set with precious stones, the central stone being a large emerald carved in the form of a face. The connecting links of the chain are designed in gold with intermittent precious stones. This is characteristic of all Etruscan ornament, and only one illustration is introduced here, as it is simply necessary to consider Etruscan art briefly, in order to preserve the thread of history, that we may better understand the influence of these people on the art of Rome.

GRECO-ROMAN ORNAMENT.

109. Historical Relations.—In the year 146 B. C., Greece was conquered by Rome, and the progress of pure Greek art suddenly ceased. The invasion of Greece and her colonies, by Roman workmen, caused the art, after this period, to become more and more tainted with the unrefined taste of the conquering nation. On the other hand, Greek artists executed vast works on Roman soil, and the subjected nation became the leaders of fashion in matters of art.

The subtle refinement of the Greek, however, became lost in the extravagant demands of Roman taste, and the resulting Roman art possessed none of the finer characteristics of the Greek style. Greek art was delicate, refined, and poetic—Roman art was voluptuous, vulgar, and extravagant. Greek art was an expression of pure beauty—Roman art was an ostentatious display.

110. During the period of transition when Greek forms were undergoing degradation at home, and conquering Roman art abroad, the style assumed a peculiar form that was neither Greek nor Roman. This style we will now consider under the name of **Greco-Roman**, though in modern times it is more often termed *Pompeian* from the fact that we derive the bulk of our information concerning it from the recently excavated city of Pompeii, which was destroyed through an eruption of Mt. Vesuvius in the year 79 A. D.

111. After Greece came under Roman dominion, the ever increasing introduction of Greek art into the Roman school caused the productions from Etruria to assume peculiar characteristics, as the local works of art yielded entirely to the influence of the conquered country. The ancient Romans possessed nothing of their own worthy of the name of art. In their earliest period, they borrowed ideas from the Etruscan builders, and it is from them that the use of the vault and arch are introduced for the first time in architecture. This introduction of a new architectural principle naturally wrought a change in the character of the ornament, and the workmen from Etruria, under the influence of, and association with, the workmen from the Greek colonies, naturally combined the art of Greece with the structural and engineering devices of their native country. When the generals of the Roman army returned from conquered Greece and brought back as plunder the objects of art that decorated Greece and her temples, they converted Rome into a museum of Greek antiquities, the presence of which changed and directed the Roman taste.

112. Mural Painting.—In decorative painting, particularly that applied to the walls of dwelling houses, the Romans borrowed everything they could from Greece, and Greek art became the ruling fashion of Rome. We know little of the plan of the Greek residences, and nothing of their decoration, but it is safe to assume that the decorations of the houses of Pompeii and Herculaneum were patterned after the decorations of the Greek dwellings seen by the Roman generals in their campaign in that country. These two cities were suburbs of Rome, and possessed much the same character as a modern summer resort. The decorations of the walls, ceilings, and pavements are totally different from anything we find in Rome, and, at the same time, show elements that must undoubtedly have originated in Greece.

These wall paintings are not all of the same value, and a number of them seem to have been executed by inferior

artists, but the beauty of others has led to the belief that they were copies and repetitions of Greek work of great celebrity.

113. Besides decorative painting at Pompeii, we find a more or less imperfect polychromatic coloring in mosaic. This branch of Roman art, therefore, became subjected to serious modifications. The Romans already possessed a rudimentary knowledge of mosaic work and they now received examples of it from the hands of the Greeks, in a more advanced state; but the inherent love of luxury in wealthy Rome, and the general contempt for matters of expense, caused the taste for mosaic work to increase and acquire real progress.

The Romans, however, were not long perverting the nature of the art that the Greeks had transmitted to them. The exquisite taste possessed by the Greeks, and displayed in their distribution of ornament, together with their advanced imitative science, would have enabled them to have realized charming conceptions in mosaic, and the Greeks would never have attempted to place mosaic in competition with the highest prerogatives of painting.

114. The Greeks are supposed to have designed the compartment of their own paved floors to represent such ornaments as branches, scrolls, festoons, and interlacings, and possibly passed onwards from these capricious forms—somewhat of the nature of arabesques—to more significant symbols and attributes, such as griffins, chimeras, tragic and comic masks, signs of the zodiac, birds, fruits, etc. It may even be inferred that the idea must have occurred to them to inlay a scene in the center panel of some of their richer pavements. At any rate, whatever the Greeks saw fit to work in their mosaic, must certainly have been designed in temperance, good taste, and with the highest artistic feeling.

115. It was characteristic of the Romans to carry everything to excess; and, as the Romans admired mosaics, they wished to have them everywhere

They were no longer satisfied to floor their courts and lower rooms with them, but inserted them in the sides of their walls, in the soffits of their arches, and in their ceilings. In fact, it is probable that they made more use of them in the latter positions than in the floors, as they soon became to be deemed of too great beauty and value to be trampled under foot.

Now, with the introduction of mosaic pictures in the side walls, ordinary pebbles, stones, natural or colored marbles, paste, and terra cotta were unable to contend with the brilliancy of paintings, especially as the taste of painters seemed to be impelled by a mad love of gaudy color and richness, so they introduced red, purple, and azure pigments, and metallic gold and silver to produce a deceptive glitter and striking contrast. Mosaic consequently demanded fresh resources, and various precious stones, such as agate, jasper, carnelian, sardonyx, emerald, turquoise, and lapis lazuli, were pressed into service, in order to produce the required effects.

Thus, Roman mosaic work became an ornamental untruth. Its productions claimed to be portraits of various objects, executed solely to please the eye, and of materials best suited to the purpose; while, as a matter of fact, they were incapable of portraying natural forms, and the materials were more suitable for pavements than for side walls. The idea was false, and even if the mosaic worker had had more shades at his command, and the painter had had fewer colors, the strife would certainly have been much in favor of the latter. Mosaic could never rationally supersede painting.

116. Pompeian Ornament.—The system of **Pompeian ornament** was carried to the very limit of caprice, and almost any theory of coloring and decoration could be supported by authority from Pompeii. The general arrangement of the decoration of the walls in the interior of a Pompeian house consisted of a *dado* about one-sixth the height of the room, on which stood broad pilasters half the width of the *dado*, thus dividing the walls into three or more large panels. The pilasters were united by a frieze at the top, varying in width,

but usually about one-fourth the height of the wall. The space above the frieze was frequently left white, and always subjected to most delicate treatment, representative of clear sky or open air; and on the background were painted fantastic architectural buildings that form a component part of the character of the style. In the best examples there was a gradation of color from the ceiling downwards, ending usually with black in the dado; but this is far from being a fixed law.

117. The colors used were mostly yellow, green, red, and black, and these were used almost indiscriminately for the various parts. Black or blue was occasionally used for the panels, but, as a rule, these colors were confined to the dado. Pilasters of yellow or green seemed to be the more popular tints, and red, green, and blue, with an occasional example of black, predominated in the panels. The most effective arrangement seems to have been a black dado with red pilasters and frieze, and with yellow, blue, or white panels, the upper part above the frieze being white with colored decorations on it. The best arrangement of color for ornament on the ground appears to have been masses of green and blue, with sparing use of red and yellow on the black grounds; white in thin lines and yellow in masses on the blue grounds; and white and blue in thin lines on the red grounds, with a limited use of yellow, as this color is not very effective on red. The Pompeian yellow approaches orange in hue, and the red is strongly tinged with blue. The neutral character of the colors thus enabled them to be used violently without discord.

118. The whole style of this system of decoration is so capricious that it is beyond the range of true art, and strict criticism cannot be applied to it. It generally pleased the eye by its novelty, but, though it was not absolutely vulgar, it oftentimes approached vulgarity, and owed its greatest charm to the light, sketchy, freehand manner of its execution, which is quite impossible to render in any modern drawing.



HISTORIC ORNAMENT.

(PART 2.)

CLASSIC ORNAMENT.

ROMAN ORNAMENT.

1. Comparison of Roman and Greek Art.--The real greatness of the Romans seems to be expressed more in their theaters, public baths, aqueducts, and other works of a public character, rather than in the decoration of their temples. The latter were but the outward expression of a religion they had acquired largely from the Greeks, and in which they had little faith, and therefore showed a corresponding want of earnestness in the art worship. In the Greek temple, it is more than apparent that the great struggle was to attain a perfection worthy of the gods. In the Roman temple, the aim was self-glorification. From the base of the column to the apex of the pediment, every part of the structure was overloaded with ornament, tending more to dazzle the eye by the quantity than to excite admiration by the quality of the work. True, the Greek temples when painted were as elaborately ornamented as those of the Romans, but with a different effect. The ornament was arranged so that it threw a colored bloom over the

whole structure, and in no way disturbed the exquisitely designed surfaces that received it.

The Romans ceased to value general proportions and contours, and destroyed them by elaborate surface modeling, and extensive molded ornament. The chief fault of this system of decoration lies in the fact that it does not seem to grow naturally from the structure, but is applied directly to the surface in the same way that was suggested in connection with the foliage on the Greek-Corinthian capital, only in the present case it is exaggerated to a greater extent.

THE FIVE ORDERS OF ARCHITECTURE.

THE GREEK ORDERS.

2. Classic Architecture.—The orders heretofore referred to furnish us with a standard of proportion with which we can measure all the classic monuments, and by which the work of the Renaissance was, and much of the modern architecture is still, proportioned.

As we have already seen, the structures of the classic ages were nearly all columnar—either with lintels connecting the tops of the columns, as the Greeks built, or with arches, according to the Roman custom. Now, the architects of the classic ages had reduced to an exact *system* the proportions of lengths to thickness in columnar work, and down to the present day we have been unable to improve on their proportions. This system is universally known as the “Five Orders of Architecture,” and it embraces every combination of lines and masses seen in the classic monuments.

In it we find the fundamental principles of proportion, and only by the most careful study of these principles can we appreciate the importance of architecture as a fine art.

3. Architectural Meaning of Order.—In its architectural meaning, the term **order** refers to the system of

columniation practiced by the Greeks and Romans, and is used to denote the column and entablature together—that is to say, the upright supporting piers, and the horizontal roof beams or *trabeation* supported by them. These two divisions constitute an order, and so far all orders are alike; but the form and proportions of the subdivisions of both the column and the entablature make it necessary to divide the original Greek orders into three classes, and when these three were adopted by the Romans, they again divided two of them, making five in all. Hence, it has become customary, in referring to the Five Orders of Architecture, to mean the Roman forms. The three original orders of the Greeks are the Doric, Ionic, and Corinthian, as explained before. Each order is an assemblage of parts subject to uniform, established proportions, and is regulated by the office each part has to perform. This so called “assemblage of parts” refers to the base, shaft, capital, architrave, frieze, etc., while the “uniform, established proportions” are the comparative sizes of these parts to one another in the same order. “The office each part has to perform” governs its size, shape, and position, and thus completes the expression of character in the order.

4. Greek-Doric Order.—The general character of the Greek-Doric order is expressive of grandeur, dignity, and simplicity. Hence, we find it used almost exclusively in temples dedicated to the most revered of the Greek deities, such as the Parthenon, at Athens. This is the most ancient of all the classic orders, and the proportions of its parts vary considerably in the different periods of its history. However, it reached the zenith of its perfection in the Parthenon, as shown in Fig. 46 of *Historic Ornament*, § 3, and it is from the portico of that temple we take the example illustrated in Fig. 1. It has already been observed that the Greek-Doric column consisted only of the shaft *B* filling the space between the stylobate *A* and the capital *C*. The latter is composed merely of an *echinus* molding under an *abacus*, which is the plain square slab upon which the architrave *D* rests. The

Greek-Doric order never possessed a base, but stood upon a *stylobate* *A*, which is the substructure or foundation usually disposed in three steps or divisions that extend entirely around the building, and by spreading the ground line of the structure,

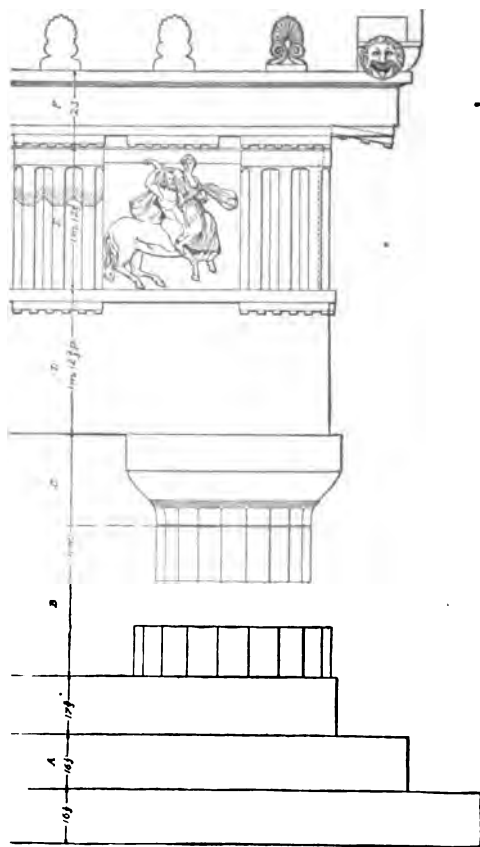


FIG. 1.

give a proper feeling of solidity and support. In the outline of the column, we first observe contraction and then expansion; the former where the echinus converges to the neck of the column, and the latter where the column swells out to form a firm and substantial support at the bottom, which is

larger than the top. With few exceptions, the column of the Greek-Doric order is *fluted*; that is, its surface is grooved perpendicularly by a series of concave channels that touch each other and form a series of ridges, or *arrises*, upon its surface—a mode of decoration that is the direct opposite of that practiced by the Egyptians, some of whose columns exhibit, not channels, but a series of convex ridges, like a bunch of reeds or stems bound together. In the Doric order, the number of channels is either sixteen or twenty, though in the other orders there are usually twenty-four. The number varies, but it is invariably divisible by 4.

Doric flutings are much broader and shallower than those of the Ionic or Corinthian orders—broader for two reasons, *first*, because they are fewer in number, and therefore divide the circumference into larger parts; and, *second*, because there are no separating fillets between them. The shallowness of the Doric flutes is due to the fact that the arrises, or edges where the flutes come together, would be thin and liable to breakage if the flutes were deeply cut. This manner of fluting Doric columns, leaving arrises between the grooves instead of fillets, has been retained in modern practice as one of the characteristics of the order. In the Greek-Doric, every detail is marked by its breadth or flatness, or by its sharpness. There are no curved moldings or surfaces except the *epitithidas* (a term given to the uppermost member of the corona) and the echinus, the latter being almost flat on its under side and finished with a sharp turn against the abacus. The breadth and shallowness of the channels, and the flat curves in which they are formed, are therefore in perfect keeping with the style, as are also the sharp arrises between the flutings, which are expressive of a severe simplicity. The horizontal rings, or *annulets*—mere grooves cut around the neck of the column to form lines of separation between the capital and the shaft—are again expressive of the most extreme simplicity, and are in direct contrast to the projecting astragal, or convex molding, of the Doric capital as modified by the Romans.

The echinus is a simple convex molding, and, from its shape, is often called a *thumb molding*. Its form is suggestive of strength, as it expands to connect the diminished upper end of the column with the overhanging abacus.

5. Doric Entablature.—The entablature of the Doric order is, like the column, the embodiment of dignity and simplicity. Its lowest division, the *architrave D*, is a plain beam, whose height, including the *tænia*, or fillet, is a trifle less than the upper diameter of the column. The middle division, or *frieze E*, constitutes a very characteristic feature of the Doric order, being invariably ornamented with its **triglyphs** and **metopes**. The former of these consists of upright blocks about one-half the width of the mean diameter of the column, having their faces grooved with two V-shaped channels, and their edges chamfered off with two half channels, thus making three channels altogether, from which the ornament derives its name of triglyph, or *three-channeled*. A portion of the triglyph, called the *fillet*, extends below the *tænia* of the architrave, and depending from it are six drops, or *guttæ*, which represent the heads of treenails or pins used in the early wood construction.

In regard to the arrangement of the triglyphs, one was placed over every column, and one or more over the space between each pair of columns, but always so spaced that the metopes, or spaces between the triglyphs, should be exactly square; in other words, the height of the triglyph was always equal to the distance between them. In the best Greek work, there was only one triglyph between each pair of columns, and this arrangement is usually called *monotriglyphic*, or single-triglyphed intercolumniation. A peculiarity of the Greek-Doric frieze was that the end triglyphs, instead of being, like the others, in the same axis, or central line, as the columns beneath, were placed quite up to the edge or outer angle of the frieze. This is accomplished by making the extreme intercolumniation less by

one-half a triglyph than the intermediate ones, thereby imparting an expression of strength to the angles of the building.

The triglyphs are thus seen to govern the spacing of the columns, and as the spacing or intercolumniation governs the diameter, and the diameter governs the height, etc., we see that nearly all the proportions of a Doric temple can be traced from the size of its triglyph. There is one exception to this, however, and that is the little choragic monument of Thrasyllus, on the south slope of the Acropolis, at Athens. This monument has no triglyphs, but a series of wreaths



FIG. 2.

ornament the frieze in their stead. The guttæ are nevertheless retained, but, instead of being grouped at intervals, they are continued across the lower side of the tænia uninterruptedly, as shown in Fig. 2.

6. The Cornice.—The third and last division of the Doric entablature, the *cornice F*, though extremely simple, is strongly characteristic and boldly marked. It is in height about two-thirds the height of the frieze, and it is divided into three principal parts, the *corona*, with the *mutules* beneath it, and the *echinus* above it. The mutules are thin plates or tablets worked on the *soffit*, or under side, of the

corona, directly over each triglyph and each metope. With the former, they correspond in width, and their soffits, or under surfaces, are set with a *rake*, or slant, which makes them parallel with the line of the pediment. They represent the under side of the wood roof beams that extended over the eaves in the earlier construction. Three rows of *guttæ*, or drops, somewhat conical in shape, ornament the soffits of the mutules, each row corresponding in number of drops with the *guttæ* on the triglyphs beneath. The **corona** is merely a boldly projecting flat member, not much deeper than the abacus of the capital, and examples exist where it is even less.

The uppermost member of the entablature, the *epitithidas*, was sometimes a *cymatium*, or *wavy* molding, convex below and concave above, or it was—as in this example—an echinus similar in profile to the echinus of the capital. The cornice is to the entablature what the capital is to the column, the crowning member of the composition, completing and ending it in a very artistic and pleasing manner.

7. The proportions of these architectural orders are measured in terms of the diameter of the column. Thus, the diameter of the column in its thickest part is divided into two portions, called **modules**, and the proportions of the order are then measured as being so many modules high or wide. A module is then divided into 30 subdivisions, called *parts*, for the convenience of smaller measurements. These terms are usually abbreviated to *m* for modules and *p* for parts, and are so designated on the drawing. For instance, in Fig. 1, the height of the column from the stylobate to the architrave is shown to be 11 modules (that is, $5\frac{1}{2}$ diameters) and the top step of the stylobate is shown to be $17\frac{2}{3}$ parts in height, while in the cornice *F* is shown 23 parts; that is, $\frac{23}{30}$ of one-half the diameter of the column.

8. **The Ionic Order.**—The Ionic order is lighter and more delicate than the Doric, being expressive of grace and

refinement rather than of grandeur and dignity. It was used by the Greeks in temples dedicated to deities representing the more worldly settlements, such as the temple

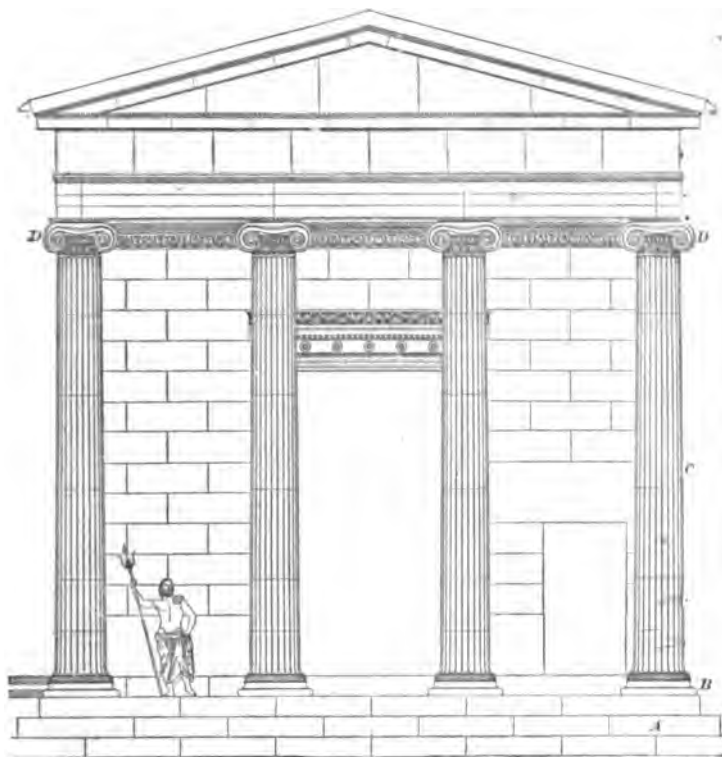


FIG. 3.

of Victory and the porch of the temple of Athena Polias, shown in Fig. 3.

Although the capital is the distinguishing characteristic, every detail of the order differs entirely from the Doric. Besides having the addition of a base, the shaft is taller and of more slender proportions, and much less tapering. The example of the Ionic order shown in Fig. 4 is taken from the porch of the temple of Athena Polias, and shows the order in the zenith of its perfection. The capital *D* is not only

more complex, but also more irregular than the Doric capital,

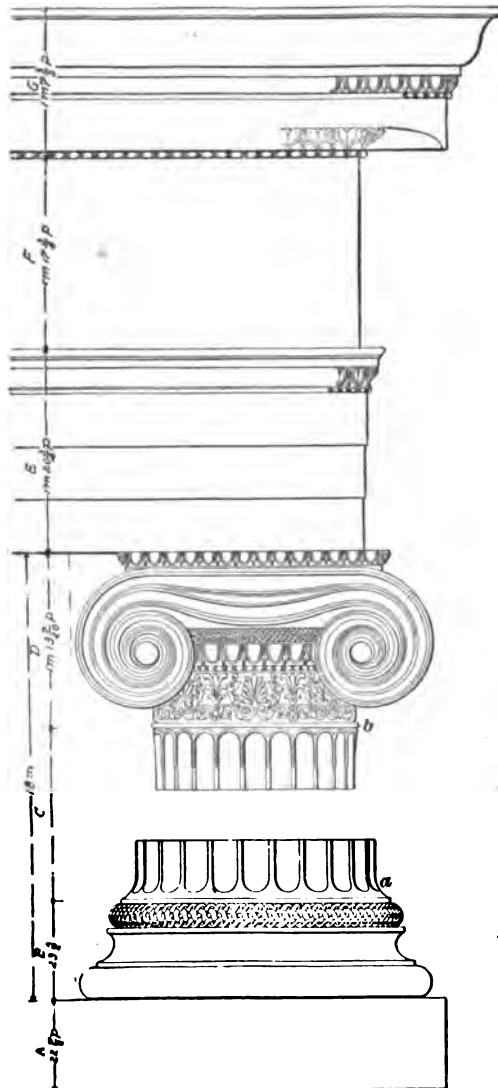


FIG. 4.

as it has two faces, or fronts, parallel to the architrave above it, one of which is shown at *D*, and two narrower bolster

sides beneath the architrave, of which one is shown in Fig. 5. This irregularity is considered by many a defect, which can be obviated only by turning the volutes diagonally, as in some Roman and modern examples, or by curving concavely the faces of the capital, instead of making them planes, thereby obtaining four equal faces. However, the Ionic capital, as used in the Erechtheum and in the temple of Nike Apteros, or Wingless Victory, on the Acropolis at Athens, suits its position as well, and is as perfect an architectural feature as is the Doric order in the Parthenon.

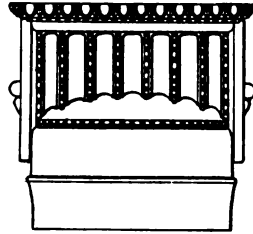


FIG. 5.

The only objection to the Ionic capital is that in the end columns of a portico it exhibits an offensive irregularity,

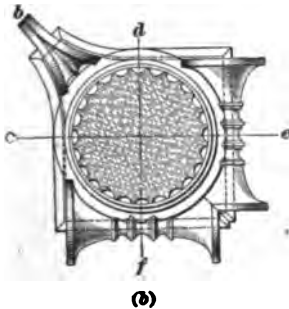
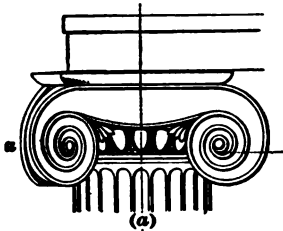


FIG. 6.

because, on the return side of the building, the bolster or side of the capital shows itself beneath the face of the architrave; yet even this is of no great consequence, unless the colonnade is continued down the sides of the building, and the capitals at the extremities present their bolster sides to the observer, while the intermediate ones show the voluted face. The Greeks, with their usual inventive ingenuity, gave the capital at the angle two adjoining voluted faces, so that it should agree with the other columns both on the front and on the flank of the building. This was accomplished by placing the volute at the angle diagonally, so as to obtain there two voluted

surfaces placed immediately back to back, as shown in Fig. 6, which is an angle capital from an Ionic temple

on the Ilissus River, near Athens. At *a* in the elevation

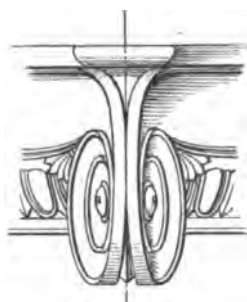


FIG. 7.

(*a*) is the angle where the volutes are turned back to back, shown at *b* in the plan (*b*), and in Fig. 7 is shown a view of these two volutes as they would appear looking directly at the corner. We therefore have two volutes and two bolsters, as in any Ionic capital; but the volutes are on two adjacent sides *c, d*, Fig. 6 (*b*), while the bolsters are on the two opposite adjacent sides *e, f*. A voluted face was thus kept to the outside on both

sides of a corner, and the columns could be continued entirely around the cella.

The Ionic order possesses a base that differs in outline and moldings according to the locality where the example is found. The best examples existed in Attica—the state of which Athens was the capital—and the most artistic base, and the one best adapted to the order is found here, and is known as the *Attic base*, shown at *B* in Fig. 4. It consists of two heavy torus moldings, separated by a scotia molding and resting on a square plinth, or stylobate. The upper torus is sometimes carved with a guilloche ornament, as shown, or is left perfectly plain.

9. The shaft *C* of the column is grooved by *twenty-four* flutes, each pair of flutes being separated by a *fillet*. These flutes extend from the **apophyge**, or swelling of the column shown at *a* on the base of the shaft, to the astragal, or fillet, around the neck. The neck is enriched with a carved honey-suckle ornament, which is carried entirely around the column. Above the neck is a fillet and bead, and above this is a small echinus, which is carved with an egg-and-dart ornament. Resting upon this echinus is a small torus that separates the echinus from the cushion-like capital, the ends of which are terminated by the *volutes*. A number of bands are run across the face of the cushion and rolled up on each side.

The abacus is a flat slab whose molded edge is carved with an egg-and-dart ornament.

The Ionic entablature, as expressed in modules, is greater than that of the Doric order; but in proportion to the length of the column, the Ionic entablature is less than the Doric. For example, the entablature of the Parthenon is about $3\frac{1}{2}$ modules high, while the Ionic entablature is about $4\frac{1}{2}$ modules high; but $4\frac{1}{2}$ modules of a column 18 modules high equal one-quarter the height of the column, while $3\frac{1}{2}$ modules of a column only 11 modules high equal about one-third the height of the column, thereby making the Ionic order lighter and more delicate than its dignified brother, the Doric.

10. The Ionic Architrave.—The Ionic architrave does not differ materially from that of the Doric. Its average height is equal to the upper diameter of the column, and it is usually divided into three surfaces, or courses, called *facias*, which very slightly project one over the other. There are a few examples where the architrave is left plain, as in the Doric order, and, in such cases, the moldings are not so heavy as in this example from the Erechtheum. The Ionic frieze, being devoid of triglyphs, and having no other characteristic member substituted for them, becomes a mere plain surface, interposed between the architrave and the cornice. This plainness may be relieved by carving thereon figures in bas-relief; but as sculpture of that kind does not belong to the character of the entablature, it is never taken into account in describing the details of the order. The Ionic cornice is a simple affair, especially in the Athenian examples, being merely a corona, with a cyma recta above it and some narrow bed moldings beneath it. The soffit of the corona is hollowed out as shown by the dotted line, and the bed moldings above referred to are left when this soffit is so cut, and are here shown dotted under the corona. Between the corona and the cyma are two small enriched moldings, a bead, and another echinus.

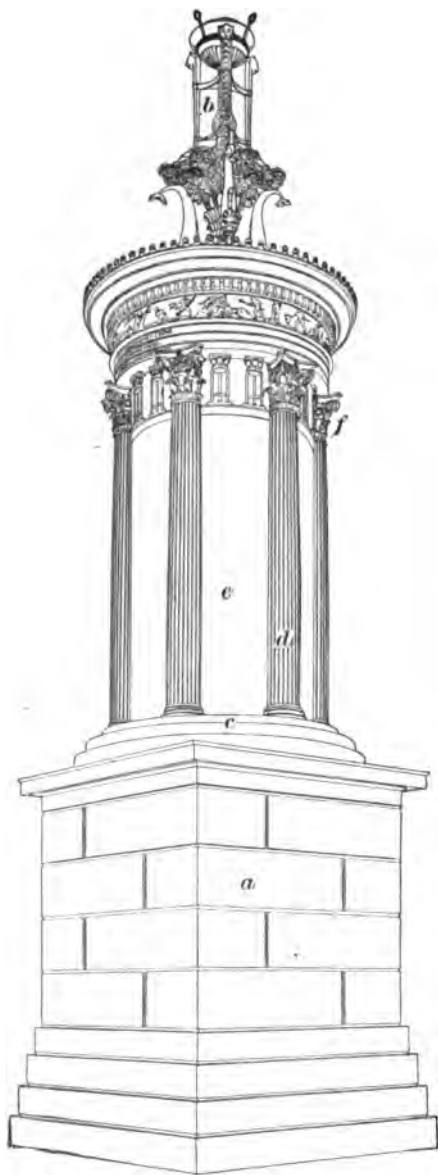


FIG. 8.

11. The Greek-Corinthian Order.—

The Corinthian order is the lightest and most delicate of the three, but it is almost impossible to determine for what class of builders the Greeks considered it best adapted, as there is but one perfect example left for us to judge at the present day, and that is the choragic monument of Lysicrates, at Athens, shown in Fig. 8. Like the Ionic, the principal characteristic of the Corinthian order is its capital—tall, bell-shaped, and richly foliated, as shown at *C*, Fig. 9. As was said with regard to the entablature of the Ionic order, the capital of the Corinthian column is higher in proportion to the diameter of the column than is either the Ionic or the Doric; but, as the shaft is longer and more slender than either of the others, it is able to carry a higher capital.

12. The Corinthian capital has two rows of leaves, eight in the upper row, and sixteen in the lower row, so dis-

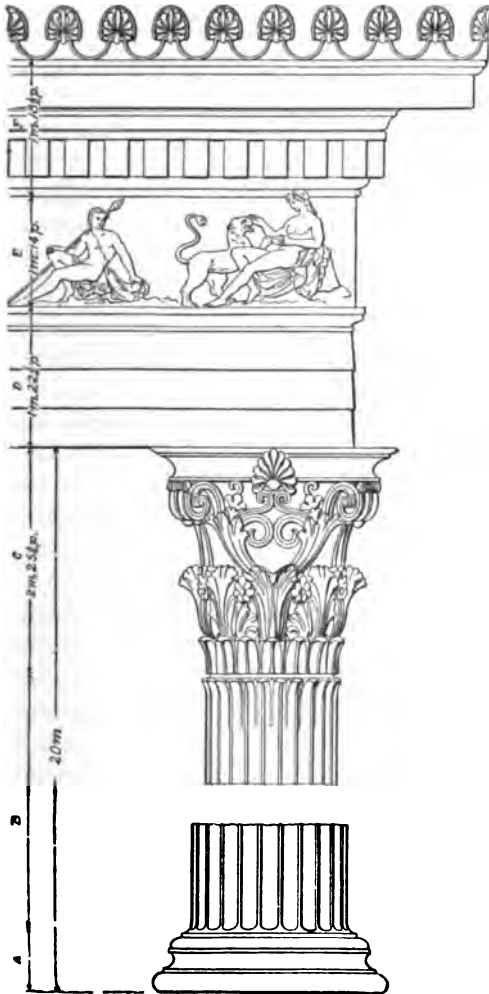


FIG. 9.

posed that, of the taller ones, composing the upper row, one comes in the center, beneath each face of the abacus, and the lower leaves alternate with the upper ones, coming both

between and under the stems of the latter, so that in the first, or lower, tier of leaves there is, in the middle of each face, a leaf between each two leaves of the upper row, and also a leaf under the stem of the central leaf above them. Above these two rows is a third series of eight leaves, turned so as to support the small volutes, which in turn support the angles of the abacus. Besides these outer volutes, which are invariably turned diagonally, as in the four-faced Ionic capital, there are on each face of the capital two other smaller ones, termed *cauliculi*, which meet each other beneath a flower on the face of the abacus.

The abacus itself is different in shape from that of either of the other two orders. In the Doric, it is, as we have seen, merely a thick slab resting on the echinus beneath it, and left absolutely plain; in the Ionic, also, it is square, but the sides are molded and sometimes carved, while the Corinthian abacus is, strictly speaking, not even square, except in general form. True, it has four equal sides, but instead of being straight, they are deeply concave in plan, and the acute point that would be formed by the meeting of these concave sides is usually cut off straight, thus making the abacus an eight-sided figure, four of whose sides are short and straight, while the other four are long and curved.

13. The base *A* of the Greek-Corinthian column is of the Attic type, almost the same as that of the Ionic order; and the shaft *B*, like the Ionic also, has twenty-four flutes separated by fillets, but these flutes and fillets terminate at the top very differently from the way they do in the Ionic. Here we have a row of leaf-like ends curling out from the column, with the fillets forming their central ribs. The edges of these leaves intersect in an angle, and this angle gradually flattens out until it disappears entirely in the surface of the flute. Above these leaf-like ends, and below the lower row of leaves in the capital, is a groove, cut entirely around the column, to emphasize the starting point of the capital, and which is said to have originally served as a receptacle for a braided band of bronze laurel

leaves, contrasting beautifully with the white marble of the monument.

The entablature is very similar to that of the Ionic order, with the exception of the cornice, which is larger and somewhat richer than the uppermost member of the order from the Erechtheum. The architrave is divided into three facias, as in the previous order, but their surfaces are not perpendicular. On the contrary, the faces are battered back so that the three arrises, or edges, are perpendicular over one another, and the offsets are formed by the batter. The molding at the top of the architrave is a simple *cyma reversa*, resting on a bead and surmounted by a rather heavy fillet. The frieze is shown here with the carved figures in relief, as it appears in the original monument, although, as said before, this carving does not form a component part of the order itself. Above this frieze is a small torus and an ovolo supporting the dentil course. These dentils are small rectangular blocks, spaced about two-thirds their width apart, and, in all probability, are the stone representations of projecting ceiling joists, which existed in an early system of wooden construction.

Above this dentil course is a *cyma recta*, supporting a *cyma-reversa* bed molding under the corona. The corona projects more in the Corinthian than it does in the Ionic order; and the crowning member, instead of being a *cyma*, as in the previous order, consists of a series of *antefixæ* supported upon a serrated band, which is separated from the corona by a small echinus.

This completes the general description of the Greek orders, a description that has been here given somewhat in detail, in order that the student may fully comprehend the liberties that were taken with these orders when the Romans converted them to their own uses.

THE ROMAN ORDERS.

14. The Five Orders of Architecture, according to the Italian architect and writer, **Vignola**, will now be analyzed and described, and the attention of the student is called

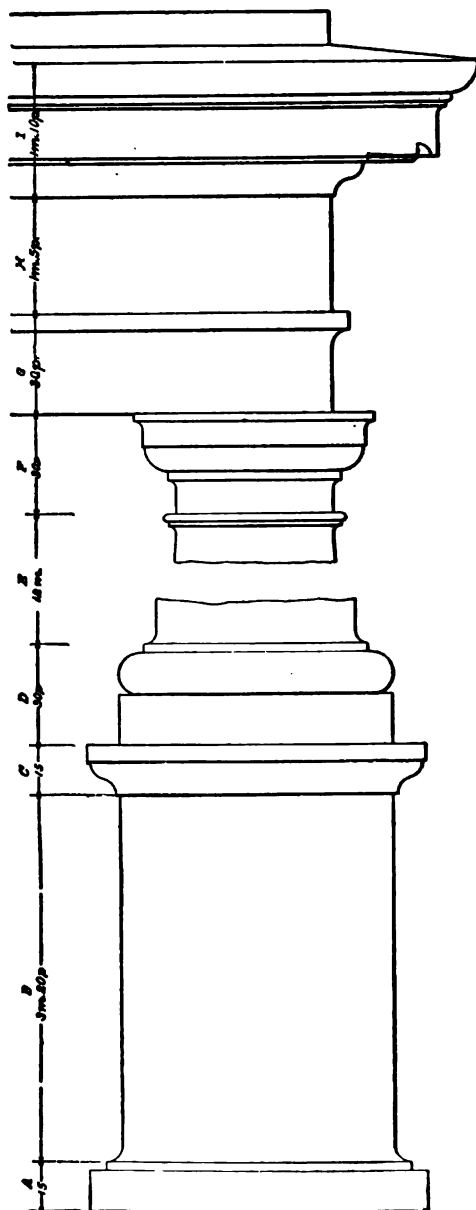


FIG. 10.

particularly to the unrefining influence of the Romans expressed in their interpretation of the Greek art forms.

The Romans were not an imaginative race, and had few original ideas in architecture. Their early works were copied from the Etruscans, and their later efforts were borrowed from the Greeks. In nothing is this fact more evident than in the first of the five Roman orders, namely, the *Tuscan*, Fig. 10.

15. The *Tuscan order* is but a modified form of the Greek-Doric, or, perhaps, more strictly speaking, it is an undeveloped form of the Roman-Doric. It takes its name from the Etruscan people, who are supposed to be its originators, though it is not improbable that the Etruscans received their ideas from the same source as did the Greek-Dorians, both nations having emigrated from Asia about the same time. One thing is certainly true, the Tuscan column and entablature bear a closer resemblance to the proportions of the Greek-Doric than they do to the Roman-Doric, which was admitted to be more or less copied from it; and the Roman-Doric resembles more the Tuscan column and entablature than it does the Greek order, whose name it bears. Hence, we see that the Tuscan is a sort of connecting link between the Greek and the Roman orders. It contains many Greek details that the Roman-Doric does not, while, on the other hand, the Roman-Doric possesses many Tuscan features unheard of in the Greek. The characteristics of the order are its *crudeness* and *plainness*, combined with its heavy moldings and lack of refinement in outline. It has, like all other Roman orders, a regularly proportioned and molded *pedestal B*, which, though not a specific part of the order itself, is generally drawn with it when the order is shown alone.

16. The *pedestal* is simply a square block *B*, with an apophyge, or escape to the fillet, resting on the plinth *A* at the bottom, and with a cyma reversa and a fillet at the top. Upon this stands the base of the column *D*, which consists of

a torus and a fillet resting upon a square plinth. The capital *F* is in some respects similar to the Doric, but lacks both the refinement of the Greek-Doric and the delicacy of the Roman. It consists of an abacus, ovolo, and necking. The abacus is square in plan similar to the Greek-Doric, and is composed of a fillet resting upon a plain fascia that has an apophyge, or curved escape to the fillet. The ovolo is a plain molding, often referred to as a quarter round, as its section is exactly a quarter of a circle.

The entablature is subdivided into an architrave *G*, a frieze *H*, and a cornice *I*, in proportions nearer to the Greek-Doric than is the Roman order of that name. But the triglyphs and mutules so characteristic of the Doric order are omitted entirely, while the moldings are large and heavy and out of proportion to the surfaces they are intended to ornament. The shaft of the Tuscan column is *never fluted, and no carving or enrichment of its moldings or surfaces is ever practiced.*

17. Comparison of Greek and Roman Orders.—Before making a comparison of the Greek and Roman orders, let us first consider some of the conditions that made alteration necessary, before the art creations of the Greeks could be adopted by the Roman builders.

The distinguishing characteristic of all Roman architecture is the persistent use of the arch. The Greeks spanned their openings with lintels—simple stone beams laid across from one column to another—and the width of the openings they could thus span was limited by the length of the stones they could conveniently quarry. But, by means of the arch, the Romans could span any width desirable; but the pressure of the arch at the abutments was in the character of a horizontal thrust, which would overthrow any ordinary column, and especially such columns as were used by the Greeks, laid up in several courses and devoid of mortar or cement.

Heavy masonry piers laid up in strong mortar with securely bonded courses, became necessary, therefore, to withstand this thrust, and the Romans, having no structural use for the Greek orders, applied them as ornament to their masonry

abutments. *This is a very important point and should be remembered.*

The orders, thus backed up by heavy piers, did not require that appearance of sturdy independence that the Greeks instilled into their supports, and they were consequently drawn out longer and thinner, and embellished with much carving and enrichment, as though endeavoring to attract the attention to their false beauty, while the piers and arches did the real mechanical work of holding up the building.

This will, perhaps, be more clearly understood by referring to Fig. 11, which is a portion of the facade of the Theater Marcellus, at Rome. The arches resting on the piers support all the mason work above them, while the columns and the entablatures are applied to the structure simply as ornament. Strip these columns off, and the building will stand as well as with them, but in appearance it will be simply a structural edifice, entirely utilitarian, and in no way esthetic.

Greek designers made their architecture beautiful by ornamenting the construction itself—remove the column, or entablature, and you remove the essentials of the structure—but the Romans designed the structure entirely apart from the ornament, and the latter might easily be removed without injury to the strength of the fabric.



FIG. 11.

18. Description of the Roman-Doric Order.—The Doric column, as used by the Greeks, was from five to seven diameters in length, and the bottom of the shaft, being of the greatest diameter, it required no base to stand on, and

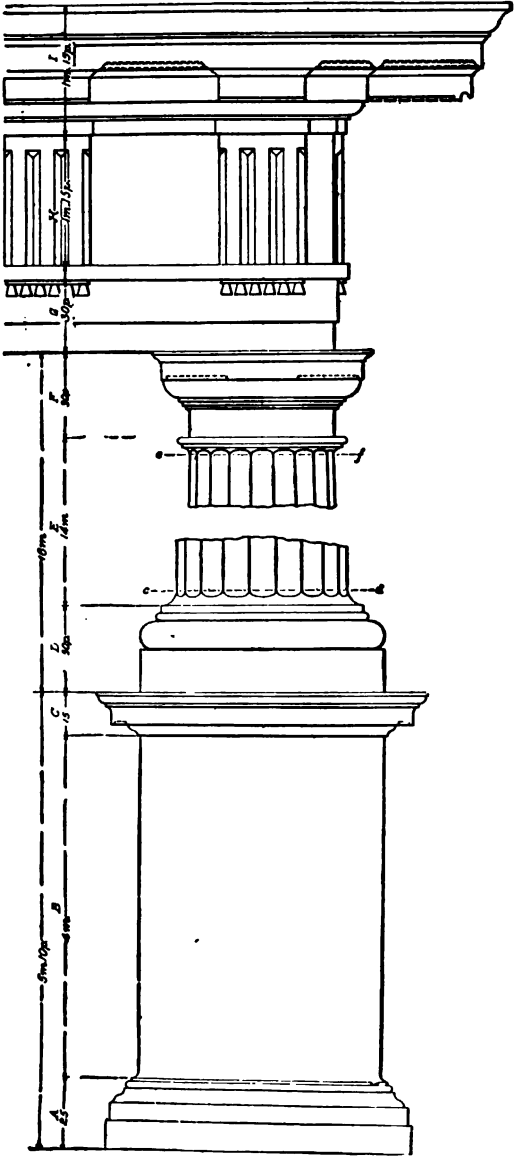


FIG. 12.

was beautiful in its simplicity. The Doric of the Romans, as shown in Fig. 12, was, on the contrary, eight or more diameters in height, and the bottom of its shaft was so small in proportion, that a regular molded base became necessary to give it an appearance of stability. There are instances where the column was used without a base, and the first story of the Theater Marcellus, at Rome, Fig. 11, is a most excellent example of the struggle to apply the Tuscan details to the Greek form. The lower order of the Theater Marcellus presents the Tuscan entablature with triglyphs in the frieze and guttæ under the tænia, while the mutules are omitted entirely, and a row of dentils and bed moldings is inserted under the soffit of the corona. It will also be observed that in this case the column is not fluted, and stands upon the stylobate or plinth without a base, while the capital is molded after the Tuscan model.

19. In the typical Roman-Doric, Fig. 12, the pedestal is higher in proportion to its width than the Tuscan, and its base exhibits more moldings than does the latter. The addition of a subplinth serves to raise the die *B* above the ground line without producing too broad a band under the base. The cornice moldings of the pedestal are much like the members of the Tuscan entablature, and show another point of resemblance between these two orders. The base of the column *D* is almost identical with that of the Tuscan order, with the slight addition of a bead molding between the torus and the fillet. The column is fluted with shallow grooves that meet in an arris, as in the Greek order, but, unlike the latter, they die out or terminate below the line *cd*, which marks the apophyge of the shaft at the base. The capital *F* of the column is decidedly more Tuscan than Greek. It is separated from the shaft by a projecting fillet and bead, which in this position is called an **astragal**. Instead of the annulets beneath the echinus, as in the Greek capital, we have simply three projecting fillets, and the echinus is rounded out until it becomes in section a mere

quarter circle. The abacus is square, but has a crowning member, and it has panels sunk in the corners of its soffit, as shown by the dotted lines.

20. Doric Entablature.—There are, in fact, two distinct systems of grouping the members of the Roman-Doric entablature: one, as in the Greek, with mutules in the frieze, and the other—an entirely Roman invention—with a course of dentils under the corona.

The mutular Doric is the order shown in the drawing plate; and, as will be at once observed, its entablature bears but a slight resemblance to the Greek model. The architrave *G* is divided into two facias, the upper one projecting slightly over the lower one, somewhat in the manner of the Greek-Ionic. The triglyphs of the frieze *H* are always centered over the axes of the columns, and, consequently, the metopes, which were always square in the Greek order, are often oblong in the Roman, with the longer axis set either vertically or horizontally.

The mutules, which in the cornice of the Parthenon were set over each triglyph and metope, existed over the triglyphs only in the Roman-Doric structures, and the soffit of the corona between them was paneled as shown by the dotted lines.

The cornice *I* is lighter and more delicate than in the Tuscan order, and its epitithidas is a cyma recta instead of an echinus.

21. Roman-Ionic Order.—The result of the Romanizing of the Ionic order is shown in Fig. 13, and is scarcely more successful than the Doric. The Romans never seemed to understand the possibilities of the order from the Erechtheum, and, as a consequence, only three accredited examples of the **Roman-Ionic** column are known in Rome today. These are the temple of Fortuna Virilis, the temple of Concord, and the second story of the Theater Marcellus. The first of these is by far the best, its volutes retaining much of the Greek character, while the last is the simplest and



FIG. 13.

plainest, and also the smallest in its proportions; but the second is remarkable for its ugliness in general, and the inartistic arrangement of its volutes in particular, which spring out diagonally so as to present four equal and similar faces.

The example shown in Fig. 13 is taken principally from the first of those just mentioned, with only such alterations as are necessary to bring it down to a general type. In it we find the pedestal slightly longer in the die than was the Doric, while the cornice *C* and base *A* of the pedestal are more richly molded than in either of the previous orders. The base *D* of the column, however, is of the familiar Attic type that has already been described in connection with the Greek-Ionic order, and exhibits the first point of strong resemblance to the Greek ancestor. The shaft of the column is nearly of the same

height as the Greek; and, in many examples, is grooved by twenty-four flutes separated by fillets, though in this example there are but twenty.

By a strange perversity, however, when we arrive at the capital, we meet a striking difference from the Athenian order. In the columns of the portico of the Erechtheum, we have a *necking*, between the echinus of the capital and the astragal of the column; but in the Roman-Ionic, the flutes of the shaft extend almost to the eyes of the volutes. In their Doric order the Romans inserted a necking above, which did not exist in the Greek order and must have been borrowed from the Attic-Ionic, or, possibly, from the Tuscan; but when they adopted the Ionic order, they seem to have taken especial pains to omit the detail that, according to previous appearances, they particularly admired. For some reason, they omitted this necking, and the Roman-Ionic capital has a flat, crushed appearance in consequence, as shown. The Roman-Ionic volute contains but one band, while that of the Greeks possessed three, though there are instances where a single band was coiled in the

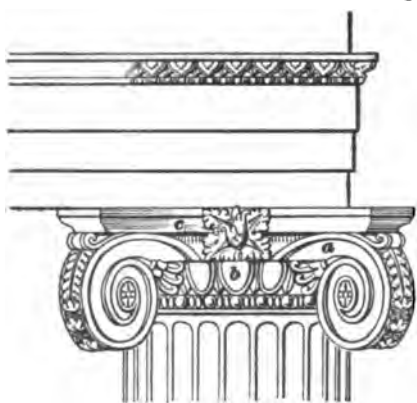


FIG. 14.

capital of the Greek order, as in the temple on the Ilissus River, Fig. 6. But the Ionic order reached the zenith of its perfection in the Erechtheum, and it is with the details of that building we must compare any subsequent Ionic constructions.

The architrave *G* and frieze *H* of the Roman order are very similar

to those of the Greek, but between the frieze *H* and corona of *I* is inserted a row of dentils with upper and lower bed moldings, which cast a serrated shadow and emphasize the projection of the corona.

22. The Ionic capital above referred to in the temple of Concord is illustrated in Fig. 14. It is shown here, not on account of its architectural beauty, for it has none, but because in certain classes of early Renaissance work, this style of cap was redesigned by Palladio and used in combinations where its defects were not so glaring. The principle on which this cap is designed is that the volutes *a* are growing out and curling over the edge of the contracted echinus *b*, while the whole is covered with an eight-sided abacus *c*, strongly resembling the Corinthian. The space under the abacus and between the volutes is filled with a carved rosette, or, in a few instances, with an animal's head.

23. Roman-Corinthian Order.—We now come to the **Corinthian**, which we may consider a typical Roman order. There is but one example of richly foliated capitals in all Greek art, and the modern Corinthian order, though probably taken from it, bears but a general resemblance to its prototype. We have gone into the details of the Greek-Corinthian capital, and the Roman style will only be dwelt upon where it contrasts with the details of the Greek. The Roman-Corinthian capital, shown at *F*, Fig. 15, has two rows of leaves, eight in each row, so disposed that of the taller ones composing the upper row, one comes in the middle, beneath each face of the abacus, and the lower leaves alternate with the upper ones, coming between the stems of the latter; so that, in the first, or lower tier of leaves, there is in the middle of each face, a space between two leaves occupied by the stem of the central leaf above them.

24. Fig. 15 is not taken from any particular edifice, but is compiled from a number of different structures, in order to get a general type of the order. The shaft here is fluted with twenty-four flutes, though in many of the best examples it is not fluted at all. The portico of the Pantheon possesses one of the handsomest examples of the Corinthian order in

Rome, but the granite columns are left unfluted, and their

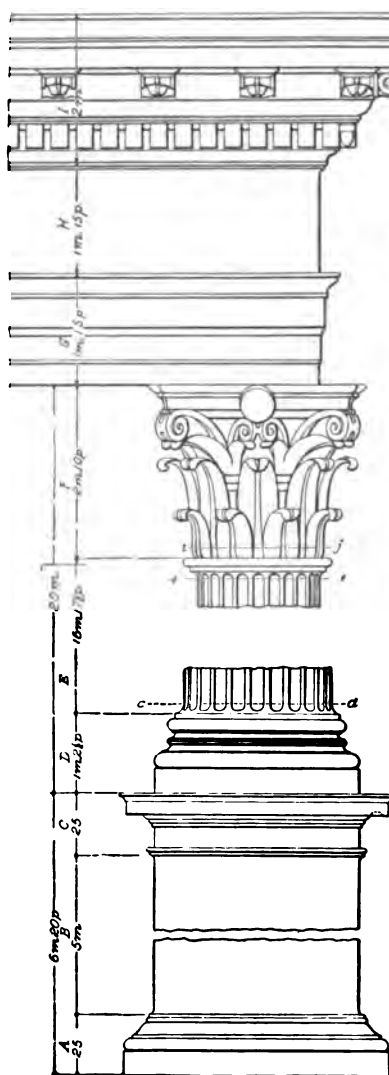


FIG. 15.

entablature, however, is very different from any we have yet described. The architrave *G* is divided into three

surfaces are highly polished, to compensate for the omission. The base of the Corinthian column varies somewhat in different examples, but is most frequently an enriched variation of the Greek-Attic. It is scarcely necessary to comment on the pedestal of either the Corinthian or Composite orders, as there is no change from the pedestal of the previously described orders, except an elongation of the die and an increase of the number of the moldings that ornament its top *C* and base *A*. The same may be said of the base *D* of the column, the only change from the previous orders being an increase of the members between the two torus moldings. The shaft *E* of the column is but slightly longer than in the Ionic order, but the increase in the height of the capital makes the entire column ten diameters high. The

horizontal bands, or facias, as was the Ionic, but instead of

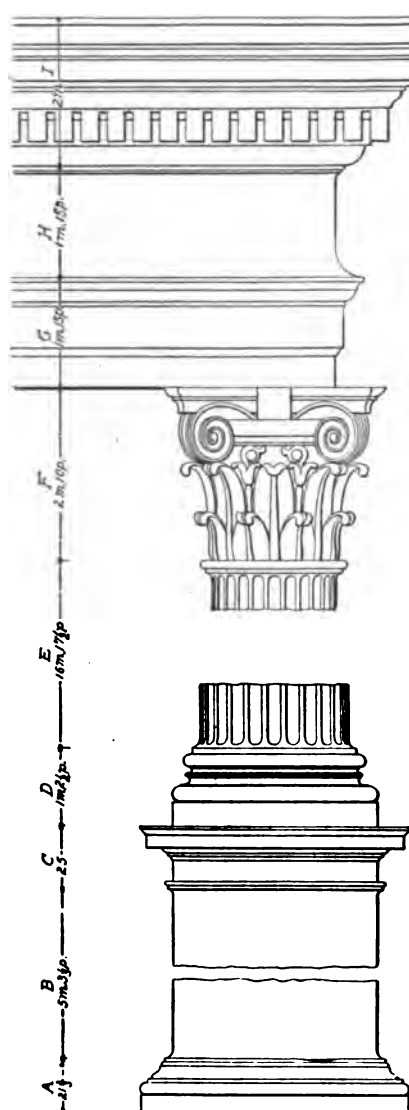


FIG. 16.

a plain projection of one facia beyond the other, they are separated by a number of different small moldings, which, in nearly every instance, were carved and enriched almost to excess. The frieze *H* is here shown as plain, but the majority of examples show it carved in high relief. The cornice *I* exhibits the greatest alteration from the previous orders that we have yet seen. A row of dentils are supported by a cyma reversa immediately above the frieze, similar to the Ionic arrangement; but immediately above this we have a heavy ovolo supporting a row, of course, of *modillions*.

25. A *modillion* is the projecting bracket supporting the corona of the Corinthian entablature. These brackets possess a volute somewhat similar to that of the Ionic capital,

but curved in the opposite direction.

26. Composite Order.—Between the Corinthian and Composite orders there is very little difference except in the size of the volutes, and, with the exception of the capital of the column, there is scarcely any difference in the proportions of their parts. Fig. 16 shows the general form of this essentially Roman composition, but omitting entirely the ornamentation of the frieze and moldings, which is as much a part of this order as the triglyphs are of the Doric. Ornamentation, as a rule, forms no part of the order that it enriches, and, consequently, should not be considered a part of the structure of the order, but the Composite order was invented by the Romans for no other purpose than to carry heavy ornamentation; in fact, it was the excessive and extravagant ornamentation of the Corinthian order that caused the Composite to spring into existence, and our example is, therefore, not complete until it receives such ornamentation as may be appropriate to its purpose. The general form is here given, and the application of ornament will be discussed later, in its proper place.

The pedestal of the Composite order is almost identical with that of the Corinthian, there being but a few slight changes in the moldings of its base and its cap, while the die is a trifle longer. The base, shaft, and capital of the column are the same height as the Corinthian, and with the exception of the capital are almost the same in design. The architrave, frieze, and cornice have the same relative proportions as in the previous order, but are treated somewhat more elaborately in the subdivisions of their parts.

The Composite capital is a combination of the Corinthian and the Ionic capital from the Roman temple of Concord, heretofore referred to. It is not an artistic combination, but its broad, strong volutes give an unusual surface on which to carve florid ornament, and, as such, it suited exactly the later-day admirers of everything strictly Roman. It suits its place in modern art very well, when in proper handling, but the Renaissance

architects were conspicuous in Italy by the interior application of the Composite order in every spot where it did not belong.

27. The Roman Acanthus.—The acanthus leaves under the Roman modillions and those around the bells of the Corinthian capitals are placed, one before the other, stiffly and inartistically; they are not even bound together by the necking at the top of the shaft, but appear to have been cut off to rest directly upon it. It will be remembered that in the capital of the Egyptian column, where the stems of the flowers are arranged around the bell, they appear to be continued through the necking of the column, and at the same time express a beauty and a truth.

The great facility that the Roman system of decoration affords for the application of this acanthus ornament to any form and in any direction, is the lamentable cause of the invasion of this ornament into most modern work. Its design requires little thought and is so easily manufactured that it has encouraged designers in an indolent neglect of one of their especial provinces—that of invention. In the use of the acanthus leaf, the Romans showed but little art. They received it from the Greeks most beautifully conventionalized, and though they went nearer to the general outline of the leaf, they exaggerated the surface decoration. The Greeks confined themselves to expressing the principles of the foliation of the leaf, and bestowed great care in the delicate undulations of its surface.

28. Character of Roman Ornament.—As said heretofore, Roman ornament consists essentially of one scroll growing out of another and encircling a flower or a group of leaves, as shown in Fig. 17, which is a characteristic piece of Roman ornament. This is the principle of Greek ornament, and though the Romans borrowed the principle, they omitted the Greek refinement.

The most characteristic method of using the acanthus leaf in Roman art can be seen in the Roman conception of the Corinthian capital, Fig. 15. The



FIG. 17.

amount of design that can be obtained by working on this principle of Roman ornament—of leaf within leaf and leaf over leaf—is very limited, and it was not until the principle of one leaf growing out of another in a continuous line was abandoned, for the adoption of a continuous stem

throwing off ornaments on either side, that the pure conventional ornament received any development.

29. Painted Decorations.—The painted decorations of Roman art are comparatively few; the style was somewhat similar to what we see at Pompeii—an adoption from the Greek, executed in the hands of the Roman artists. The coloring is hardly worth great consideration, as it possessed nothing of an original character, and the student should bear in mind that all art forms of Rome are borrowed forms. Her construction she inherited from Etruria, and combined it with the art obtained in Greece. In fact, it might be said that there is no true Roman style, that is, to say, executed by Romans themselves, for the Roman was essentially a warrior and a politician, and his art works were designed by the subjugated Greek and his structural works put into effect by descendants from the Etruscans.

The transition of Greek ornament into the styles of Europe was simply delayed by the conquest of Greece

by Rome, and, during the delay so caused, the style was degraded, and spread throughout the country in that condition.

ROMANESQUE ORNAMENT.

30. Development of the Romanesque Style.—In considering the Romanesque style, it must be borne in mind that the Roman Empire covered almost the entire continent of Europe, and that Roman art had penetrated as far west as Spain and as far north as England and the Baltic Sea. After the downfall of the Western Roman Empire, the conquering races from the North attempted to carry out the Roman style of building as they found it in different parts of the country, and the endeavor to apply these art forms under a new system of religion, and influenced by different conditions of government and living, together with the necessity of practicing a rigid economy in material, caused an alteration of the original Roman style and brought about the style that we now consider Romanesque.

31. The fall of the Western Roman Empire, in 476 A. D., therefore marked the beginning of a new architectural era throughout all Europe (except possibly in the Eastern Empire, with its capital at Byzantium), and the so called dark ages that followed this event may be considered as a formative period of western civilization during which the barbaric conquerors of Rome became gradually Christianized and were subjected to the authority and educational influences of the Church.

Under these conditions a new architectural style was developed, founded on the traditions of the earlier Christian builders, but modified in different regions by local influences. The prevailing characteristics of the style were at first essentially Roman, for Rome soon recovered her antique prestige as the leading city of Europe, and the Roman monuments covering the soil of Southern

Europe were a constant object lesson to the builders at that time.

32. Influence of the Church.—Romanesque architecture was distinctly ecclesiastical. Civilization and culture emanated directly from the Church, and the requirements and discipline of the religious orders gave form to the builders' art.

Corinthian columns, marble incrustations, splendid mosaics, etc. were not to be obtained in the forest lands of France and Germany, and the priests caused to be erected with unskilled labor churches of stone, and the struggle with this structural problem underlies the entire system of Romanesque design.

33. System of Building Under Roman Domination. The Romans, when they wished to erect grand monuments of public utility, could send to the spot, no matter how remote, an army of soldiers, and, by their tyrannical system of government, compel the very inhabitants of the locality to desist from all their employments and work for the emperor of Rome. They thus achieved by a multitude of hands those prodigious results that today stand monuments not only of their enterprise but also of their despotism.

Had the builders of the Middle Ages desired to pursue this course, where would they have found the army of workmen? In countries not only without stone but without money to buy it, without beasts of burden to transport material if they could buy it, without even roads over which to travel, how could these people make any attempt to follow the course of their Roman predecessors?

Bearing these facts in mind as we study Romanesque ornament, we will readily see in the earlier examples an attempt to copy Roman art—an attempt that failed as a duplication of an antique style, but was eminently successful in the development of a new style that was much more rational than the one back to which the Middle-Age builder had been looking.

34. In Fig. 18 is shown the capital of a column, the moldings of which and the crude formations of whose leaves are easily traceable to the Roman-Corinthian order;

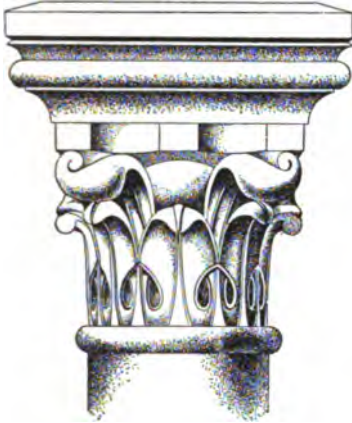


FIG. 18.



FIG. 19.

and the capital shown in Fig. 19, though entirely different from that shown in Fig. 18, also illustrates the influence of classic art and the Corinthian order in the formation of the style at this period.

More clearly, perhaps, than either of these is the base shown



FIG. 20.

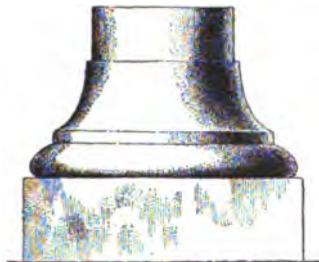


FIG. 21.

in Fig. 20, which dates back to the eleventh century. Here the moldings are almost identical with those seen on the classic columns. In Fig. 21 is shown a base of later date, which exhibits a radical departure from the classic lines.

35. The frieze shown in Fig. 22 is taken from an example in Southern Germany, dating back to the twelfth century.



FIG. 22.



FIG. 23.



FIG. 24.

The treatment of the leaf forms there clearly shows a classic origin, but the boldness of the treatment shows an inclination

to become independent of the traditions of the classic style, and in Fig. 23 the ornament, taken from a French church of the twelfth century, shows a decided freedom from the governing rules of classic design, although the character of the curves and proportions of the surface covered is strongly suggestive of the Greek anthemion. In Fig. 24 is shown a most independent example, where we have the main running stem and the branches from alternating sides, while the small pyramid forms cut in the main stem appear here and are characteristic of the Romanesque period.



FIG. 25.

In Fig. 25 is shown an example of German twelfth-century art that shows the possible influence of Celtic work. Observe that, complicated as this design at first appears, it is really very simple in construction and contains only one leaf form arranged in two positions. The entire free flowing lines are then woven around these forms to produce a most satisfactory effect.

'36. In repeating ornament and diaper patterns, Fig. 26 shows a simple arrangement of circles from the church of St. Denis, at Paris, dating back to the twelfth century, while



FIG. 26.

Fig. 27 shows a diaper pattern from the Lincoln Cathedral, in England, of the same period, showing a radical difference in style on account of the remoteness from Rome.

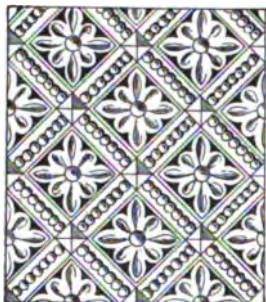


FIG. 27.

In Figs. 28 and 29 are shown two patterns taken from stained-glass windows, the former of German design and the latter French. The simplicity of the design in each case is its distinguishing characteristic, and, though in appearance somewhat complicated, a little study eliminates all



FIG. 28.

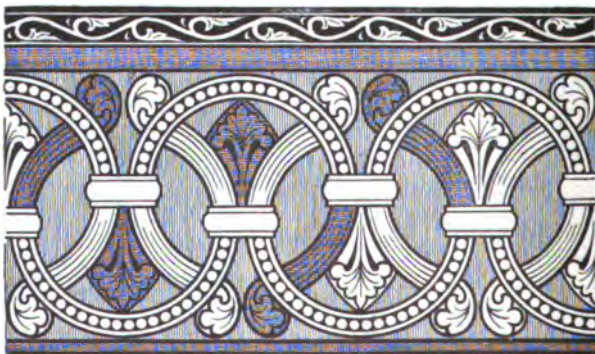


FIG. 29.

complications, and shows the geometrical principle on which it is constructed to be of utmost simplicity.

37. Origin of Gothic and Byzantine Ornament.—

From these few examples, with which the artists of the Romanesque period decorated their structural details, we see that the application of Romanesque forms was simple—simple from a necessity of economy, and simple on account of a freedom of mind devoid of any art traditions.

The builder and designer of the twelfth and thirteenth centuries had no memories of Rome or Greece to follow, and no historical forms that had been handed down from generation to generation, to copy which was almost required by law, and to depart from which would have been a sacrilege in the eyes of his country. The medieval builder attacked his problem with no other tools than his eye and his brain, and gradually developed the form of art that we call Romanesque, and that culminated in two entirely new styles, both in construction and ornamentation—the *Gothic* in the West and the *Byzantine* in the East.

BYZANTINE ORNAMENT.

38. Oriental Influence.—In the East, around the city of Byzantium, Romanesque ornament was influenced by the art of Assyria and Persia. In fact, its entire character became tinged with an oriental spirit, and, in the course of the next three or four centuries, it developed into a new and entirely different style of architecture and art, known as **Byzantine**. The old Roman forms became obsolete and gave place to new forms, original, beautiful, and artistic.

It will readily be understood that there would be a period of transition between the slowly developing Romanesque and the finished Byzantine style, and it is with such examples of ornament as date from this period of transition that uncertainty as to their proper classification arises. It is more difficult to distinguish between these styles, whose

transition took place peacefully, than between the Greek and Roman styles, where the transition was sudden.

39. The Romans had wealth, ambition, and, to a certain extent, taste, but their taste was tainted with vulgarity, through their ostentatious display and desire to express their power as a nation. Consequently, they seized boldly upon the Greek art forms and elaborated them indiscriminately in their Roman designs. The refinement and delicacy of the Greek style was thus immediately wiped out, and there is little difficulty in distinguishing between the ornament of Greece and that of Rome; whereas, between the ornament of the Romanesque and that of the Byzantine period there is such a gradual change that distinction is in many cases impossible.

40. Hagia Sophia.—Byzantine art, though spread to a greater or less extent throughout the continent of Europe, originated in and around the city of Constantinople, formerly called Byzantium. The great church of Hagia Sophia was built by the Emperor Justinian, in the year 532 A. D., and is the earliest monument purely Byzantine in style. A peculiarity of this monument and its style is the fact that we find so perfect an example of an original style with so little transition toward it.

The emperor declared that he would erect a church, "That should be the grandest monument ever built by man," and the governors of even the most distant provinces of the empire were ordered to ransack all the ancient Roman buildings for sculptures, precious marbles, and works of art, to be used in this edifice. Eight columns of pure white marble were brought from Palmyra, and eight more of deep-green marble were stripped from the temple of Diana, at Ephesus, and shiploads of costly relics were brought from all sections of the empire to become a part of this great structure.

Ten thousand men toiled night and day for six years, and the royal treasury and private purse of the emperor were

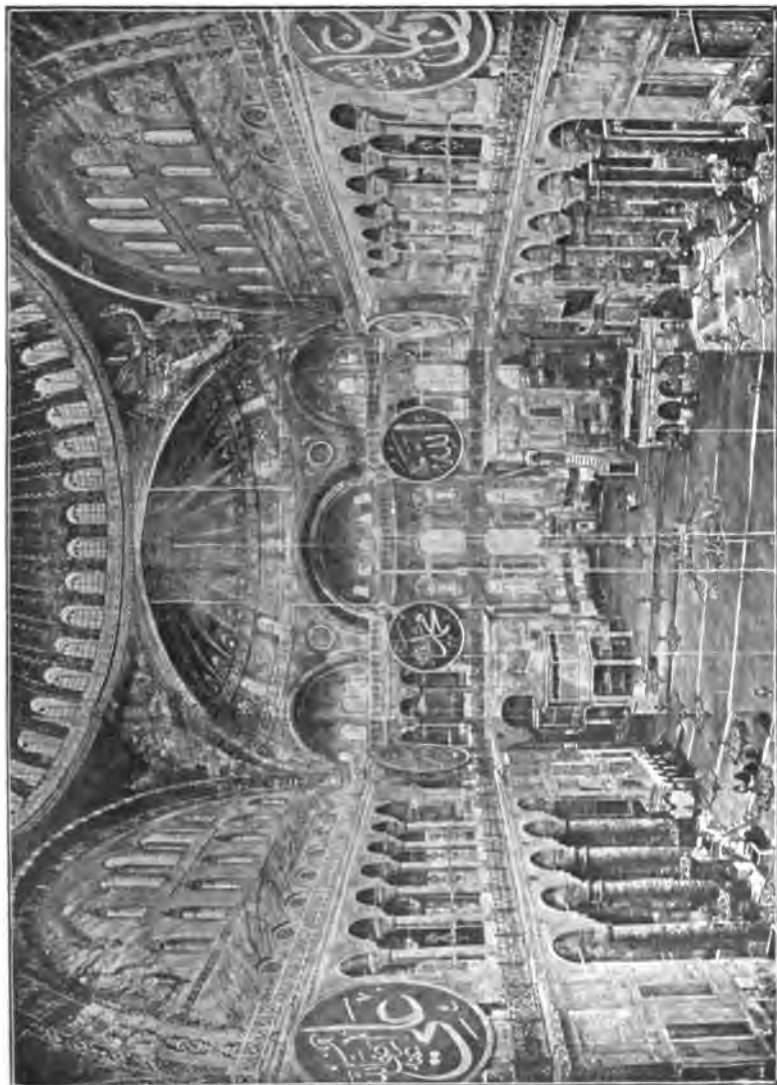


FIG. 30.

exhausted by the prodigious expense. But the church was built, and is certainly one of the grandest architectural monuments the world has ever seen. The plan and construction of this edifice is no more remarkable than the scale and treatment of its interior decoration (see Fig. 30), and it stands to Byzantine architecture as the Parthenon stood to the Greek. Unfortunately it is now converted into a Mohammedan mosque, and the severity of the Mohammedan religion required that its beautiful interior decorations should be covered from sight by repeated applications of whitewash. However, we have been able to secure reproductions of some of these great ornaments so characteristic of the Byzantine style.

41. Examples of Byzantine Style.—At Ravenna, which was the seat of government of the Eastern Empire under Justinian, the church of San Vitale is also a fine example of the Byzantine style, and at Ravenna, Byzantine art reached its height in this edifice.

Venice also felt largely the Byzantine influence, and the church of St. Mark, built in the eleventh century, is a monument patterned largely after the plan and decoration of Hagia Sophia; and, extending as far south as Sicily, we have the cathedral of Monreale, near Palermo, showing strong Byzantine influences, but at the same time possessing many details



FIG. 31.

that are so strongly characteristic of the Romanesque style that it is difficult in many cases to classify them.

42. The capital shown in Fig. 31 is from one of the columns in the first tier of arches in the church of Hagia Sophia, at Constantinople. The scrolls in the upper part of this column undoubtedly have their origin in the Ionic order, and, though the entire capital is

decorated with the conventionalized acanthus leaf, observe how widely different it is from any Roman model. Here the block of the capital is sound and heavy, and at its bottom is a foliated ring that seems to bind it together, while the carved leafwork grows out of the top of the column and enters materially into the construction of the capital itself.

Another Byzantine capital, shown in Fig. 32, is taken from another church in Constantinople, built about the same time as Hagia Sophia, but less original in detail. Here the heavy scrolls project



FIG. 32.

from the angles of the capital very much in the same manner as the volutes in the temple of Concord at Rome, and the place usually occupied by the abacus is filled by a heavy semipyramidal form on which the ornament seems to be applied as a surface decoration more than a component part of the construction.

The effect of this illustrates, however, a radical departure from the traditions that limited the architectural designs in Roman art; and even when we arrive at Byzantine capitals of the eleventh century, as seen in St. Mark's, at Venice, Fig. 33, we can still observe the influence of Roman art, but thoroughly subservient to the Byzantine school of design.



FIG. 33.

In Fig. 33, the volutes at the top of the column, the shape of the capital as it swells out to the abacus, and the general character of the

entire detail are strongly suggestive of its Roman-Corinthian origin; but the strictly conventional treatment of the leaves, the character of the scroll around the abacus, and the binding together of the ornament in the construction show plainly the influence of the work in the East.



FIG. 34.

Fig. 34 is another example of Byzantine capital, from Italy, and is even more freed from Roman influence than that of the previous example. The long elliptical curves formed by the leaves, the sharp-pointed lobes, and the deep indentations are all suggestive of its Byzantine origin, while the little row of dentils so uselessly arranged around the top show the difficulty of producing any work in Italy without some taint of classic spirit.

43. The **running ornament** is illustrated in Fig. 35, which example is taken from the same church as Fig. 32, where the leaf form is thoroughly conventional, and, though



FIG. 35.

tending slightly toward a scroll, is governed by a continuous wavy line, from opposite sides of which the leaf forms branch.

Fig. 36 is an example of geometrically arranged running ornament from Hagia Sophia. The main geometrical forms, as will be observed, are circles, but these circles are not formed complete in themselves, but result from the crossing

and intersection of two wavy lines precisely the same in general character as the wavy line that forms the governing element of Fig. 35. Instead of branching foliage from oppo-

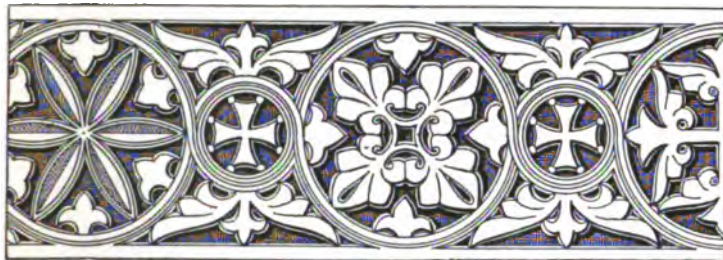


FIG. 36.

site sides of the lines, in the latter case, however, geometrical figures are arranged within, and foliated forms that have the cross of St. George for their guiding element are used to form prominent details of the design.

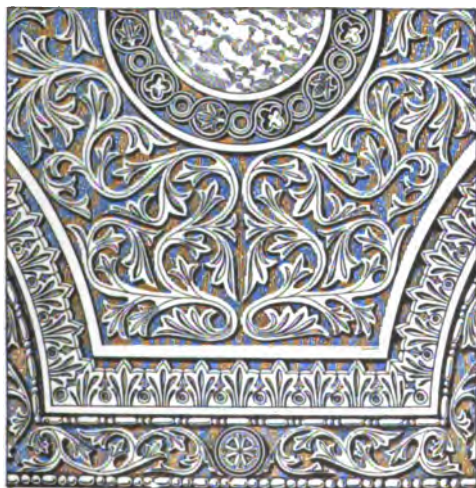


FIG. 37.

44. Going back again now to the church of St. Mark, built in the eleventh century, we have a wall decoration

between two arches, shown in Fig. 37. Tracing out the outline of this running surface ornament, it will be observed that the same wavy line governs its principle and direction, as in the case of Fig. 35; but a close study will show that the branching of leaves from one side is accompanied by a branch from the opposite side, so near that the general feeling is of a scroll growing out of a scroll, somewhat after the order of classic art. Above this ornament, however, the semi-circular ring is ornamented by geometrical devices within a governing outline, precisely similar to that seen at Hagia Sophia, Fig. 36.

In all these examples, the student will observe that the character of the leaf is particularly uniform, that it is in the principle of the decoration that we find the greatest variation, and that the variation in this character only amounts to a greater or lesser display of oriental or classic influence.



FIG. 38.

45. Examples of Byzantine art found in Greece are usually purer than any found in Italy, as Roman art and influence never secured a thoroughly characteristic foothold in the conquered country. Byzantine art was built on Greek

art in the first place, and examples of it on Greek soil are usually of excellent character. Besides this, Greek examples have not been mutilated by Mohammedan invasion to the extent that we find them in other eastern countries, and the color treatment and contrast can be best studied there.

46. Ceiling Decoration.—Fig. 38 shows an example of ceiling decoration from the church of St. George at Thessalonica. The circular ornament within the border was executed in red on a blue ground, though the hollow-sided square in the center of it was gold, as were also the triangles at the four corners. The peculiar outline of the device adjacent to the four sides of the interior rectangle is suggestive of Arabian origin, and is exceedingly ingenious in its method of preserving symmetry and preventing awkward repetition. The border around this was executed entirely in gold on a blue ground, with the exception of the extreme outside line, which was red.

47. Wall Decoration.—Fig. 39 is an example of wall

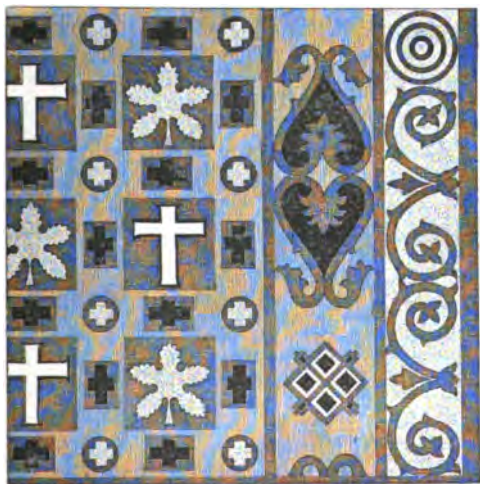


FIG. 39.

decoration from the same edifice, the rectangles and circles containing the leaves and crosses, all being worked with a

plain gold round, while the figures and half of the smaller crosses were green and the outlines of the larger crosses and the remaining smaller crosses were red. The effect is very rich, and the arrangement of the rectangles and smaller circles shows a knowledge of surface division that is well carried into effect. The student's attention is particularly called to the fact that the shape of the groundwork between the rectangles is also crucial, and that every effort is made to bring that symbolic detail into prominent display.

48. In giving examples of Byzantine ornament, nothing could be more characteristic than the stone panels herewith illustrated. The style of the ornament itself, the character of the carving, and the development of the geometrical pattern are all details that are shown here in a most characteristic Byzantine form.

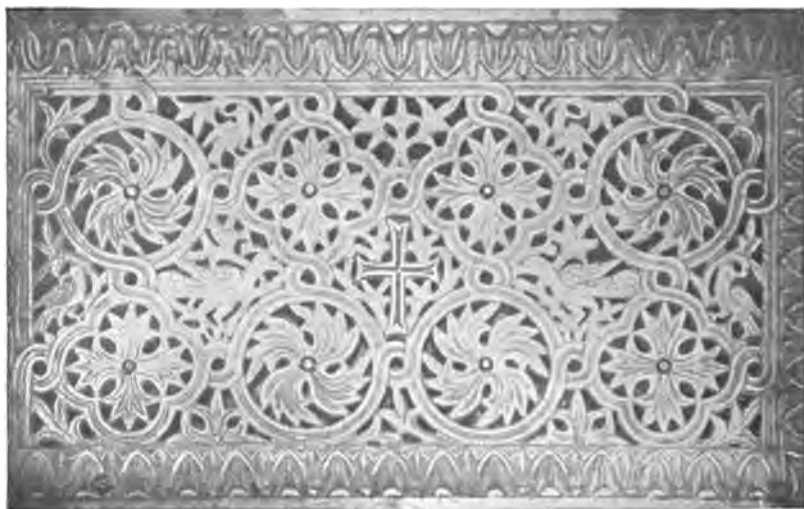


FIG. 40.

49. The pierced screen shown in Fig. 40 is from Ravenna, and illustrates the geometrical pattern based on an arrangement of circles (somewhat after the style of the Celtic ornament), in which is carved the typical Byzantine

leaf. The cross outlined in the center was emphasized in the original by a plating of gold, and the spaces around the foliage were filled with birds whose peculiar modeling and conventional outline is characteristic of the Byzantine style. Another characteristic of the style, shown clearly in this illustration, is the sharp angular cutting of the leaves, the deep circular and elliptical openings between the lobes of two adjacent leaves, and the tendency of the whole panel to appear in high relief on a dark ground rather than to be pierced through entirely.

In Fig. 41 is shown another screen of the same character, where the interlaced bands that form the geometrical outline

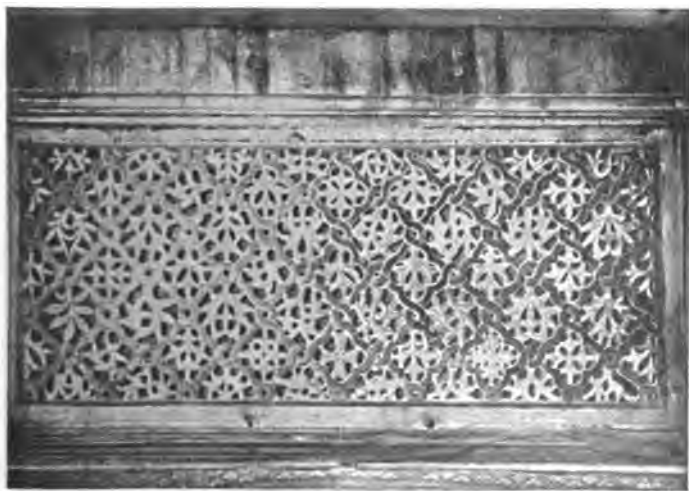


FIG. 41.

of the foliated ornament were originally gilded, and the leaf forms carved between them are similar to those in Fig. 40.

50. Fig. 42, however, shows a trend in a different direction. Here the openings in the screen are larger, the exterior portion of it being outlined with a design undoubtedly derived from the Grecian fret, while in the center a large Latin cross divides the panel into four smaller rectangles,

each filled with a particular device symbolic of Christianity and characteristic of the Byzantine style. Observe also the running foliage around this panel, and its branching leaves and fruit, alternately from opposite sides, and note the differ-



FIG. 42

ence between this style of treating foliage and that of the Roman and Greek artists, where continuous foliage was accomplished by growing one spray or stem out of a calyx or cup from which a scroll emanated.

51. The capital of the column shown in Fig. 43 is also from Ravenna, and the peculiar looking birds on the upper part, as well as the sharply indented foliage, are characteristic of this style. Here, also, is seen that same geometrical pattern as the governing outline to which we called attention in Fig. 40, and also the wandering-vine border line,

throwing off its leaves on alternate sides in a similar manner to the outline in Fig. 42.

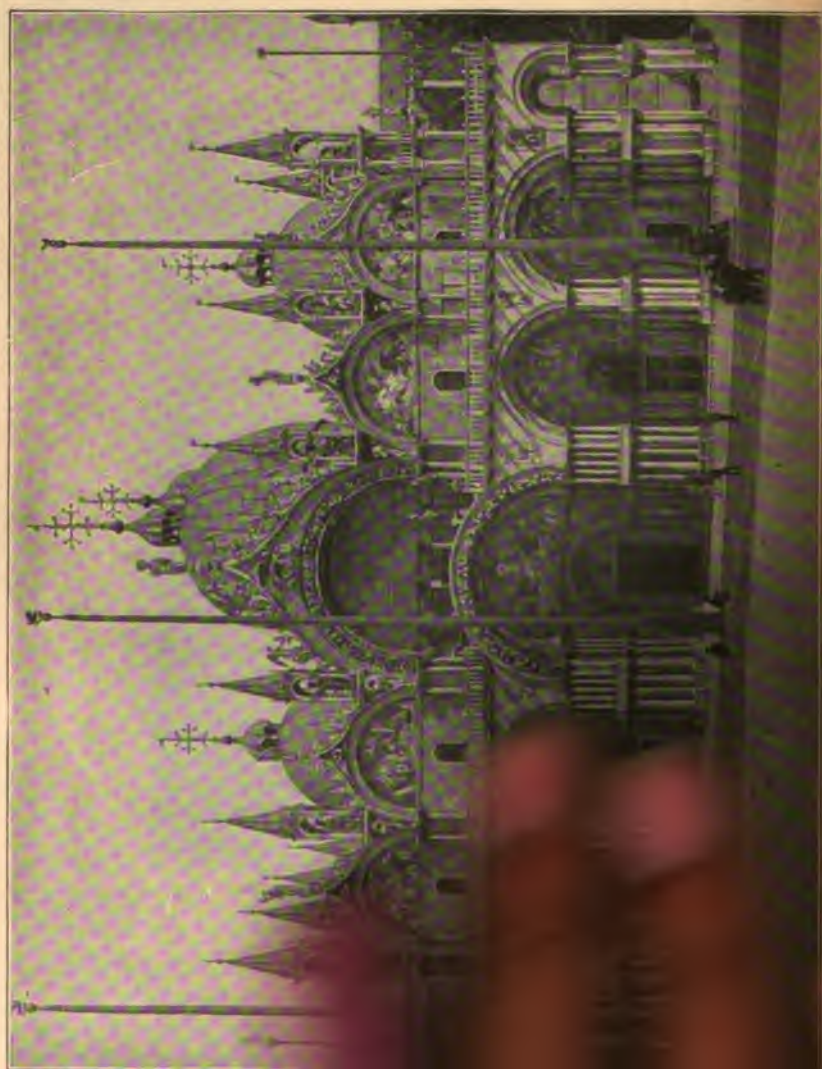
That the capital of the column is cut in full relief is clearly shown by the fact that the light shines through the screen work on to the stone interior, as may be seen. This style of capital will be found throughout Northern Italy where



FIG. 43.

any example of Byzantine style exists. The dark portions of it were originally gilded, and must certainly have presented a most remarkable effect.

52. Turning to St. Mark's, at Venice, Fig. 44, we find a frieze such as shown in Fig. 45, the lines of which are based on identically the same motives as the screens we



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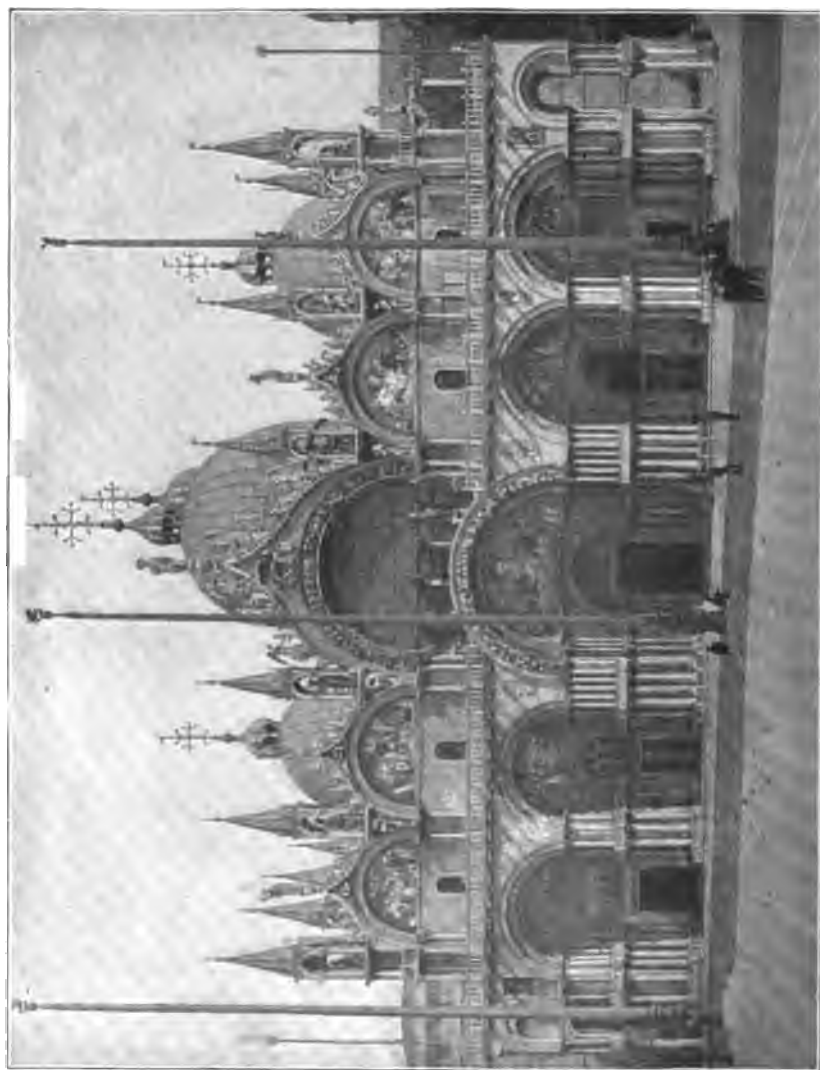


FIG. 44.

have already studied; but the carving, though in high relief, does not pierce the screen, and the border of the panel, as well as the treatment of the foliage within the panel, shows a highly developed Byzantine feeling. Observe, however,



FIG. 45.

the influence of its proximity to Rome on the treatment of the scroll forms. In the central part of the panel we do not have the running vine, with its leaves branching from each side, but a partly controlled tendency to grow one

scroll out of another—a tendency that is so well kept in submission that it does not materially affect the delicacy of the design.

In the same church, we find the panel shown in Fig. 46, the rounded forms of which are not often found in this style. Note, however, the severe conventionalism of the foliage treatment, and also the independence of the artist



FIG. 46.

concerning the preservation of absolute symmetry. On one side, the vine runs off the panel both at the top and edge, and, on the other side, runs off the panel on the top only. One of the two central leaves extends over the molding of the panel frame; the other is carved entirely within it.

53. In Fig. 47 is shown a well at Venice, the details of which illustrate clearly the strong, bold, outline effect characteristic of Byzantine carving. The guilloche border around the top and the leaves patterned after inverted anthemions are suggestive of classic origin, but are treated with such

strong Byzantine effect that the classic taint is fairly obliterated.

54. Ingenuity of Byzantine Ornament.—The geometrical arrangements in Byzantine ornament are exceedingly ingenious, and especially remarkable in mosaic work,



FIG. 47.

the monotony of which they destroy by well planned and complicated constructions based usually upon a variation of the straight line and the right angle.

In Fig. 48 is shown one of the doorways in the cathedral of Monreale, near Palermo, around which mosaic patterns are inlaid in the jambs and also in the flanking walls. The pattern of this mosaic is typical of examples of that art in the Byzantine style, as the Byzantine mosaics can nearly always be distinguished from the Roman mosaics by the

fact that the geometrical construction forms an integral part of the design. There is one style of this mosaic ornament that is also typical of the Romanesque period, particularly

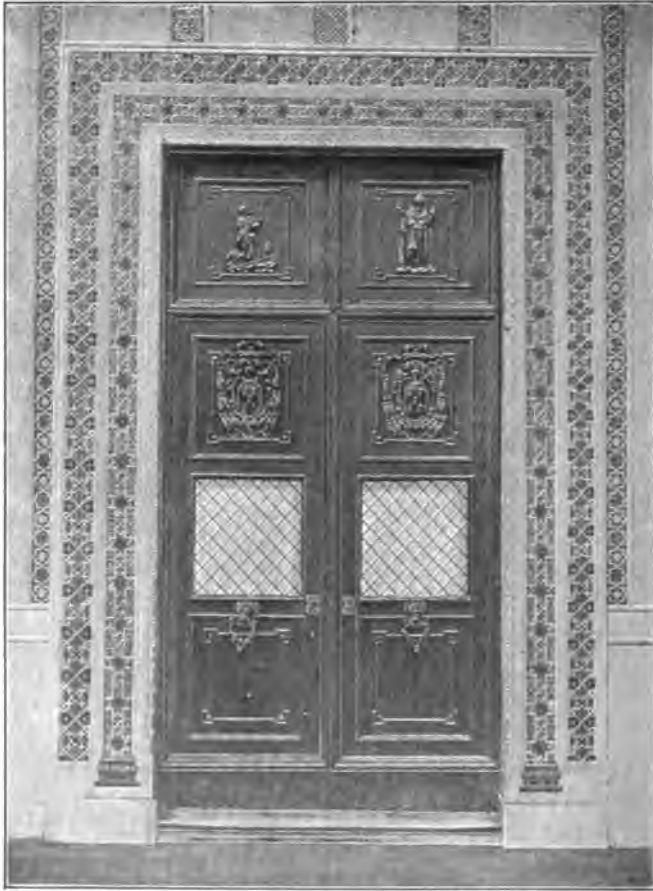


FIG. 48.

in Italy. This consists of a geometrical arrangement of lozenge-shaped pieces of glass in a complicated series of diagonal lines, the directions of which are defined and terminated by means of pieces in different colors.

The examples of this work in Central Italy are much simpler than those of the southern provinces of Sicily, where the influences of Saracenic art are very much felt; and this



FIG. 49.

mosaic work, as observed in the southern provinces, is very difficult to classify positively, either in the Romanesque or the Byzantine style.

55. In Fig. 49 are shown some clustered columns from the cathedral of Monreale. One group of four columns is richly carved with the interlaced ornament so familiar in the examples of Byzantine art, while the adjacent columns, inlaid with zigzag lines of mosaic, are more suggestive of Romanesque art, and the capitals and bases of both sets of columns are more in accordance with the Romanesque idea than with the Byzantine. This, however, may be largely accounted for when we consider that both styles were merged together in Sicily at about the close of the twelfth century, and the examples in Figs. 48 and 49 are here given in order that the similarity of styles may be carefully studied.

56. Sculpture in Byzantine Art.—Pure Byzantine ornament is distinguished by broad-toothed and acute-pointed leaves, which in sculpture are beveled at the edge and are deeply chiseled throughout and drilled with deep holes at the springings of the teeth. The running foliage is generally thin and continuous. The ground, whether in mosaic or painted work, is almost universally gold. Thin interlaced patterns are usually preferred to geometrical designs, and the introduction of animal or other figures is very limited, especially in sculpture, and in painted work is confined principally to holy subjects in a stiff conventional style, exhibiting little variety of feeling. In fact, in Byzantine art, sculpture is a very secondary importance.

57. Sculpture in Romanesque Art.—Romanesque ornament, on the other hand, depended mostly on sculpture for its effect. It is rich in light and shade, deep cuttings and massive projections, and a great intermixture of figure subjects of every kind with foliage and conventional ornament. The place filled by mosaic work in the Byzantine art, in the Romanesque is supplied generally by paint. In colored ornament, animals are as freely introduced as in sculpture, and the ground no longer confined to gold, but composed of blue, red, or green. In other respects, however, the two styles are very much alike.

ASIATIC ORNAMENT.

58. Characteristics of the People.—Before studying the style of the ornament of this section of the eastern hemisphere, let us consider how different are the characteristics of this people from the European nations whose ornament we have so far analyzed. Oriental people are traditionally immobile in character and unprogressive in their methods of business and manufacture. The processes of weaving, carving, and other practices of art design are transmitted carefully and faithfully in the oriental nations from generation to generation, and it is therefore practically impossible to assign a precise date to any one production, so similar are the designs. The study of oriental art is therefore freed from any minute chronological examination, and the student is able to consider the subject in a broad sense, considering only primary and original styles that predominate over lesser divisions and personal modifications. These styles can be divided into three general groups: (1) *Chinese* and *Japanese*, (2) *Indian*, and (3) *Arabian*.

CHINESE AND JAPANESE ORNAMENT.

59. The Chinese are a nation of great antiquity, and we can discover no detail of art training that they have ever given to or received from any other civilization. This nation has been ever satisfied with itself, and this lack of progression and consequent isolation have given it an originality of character devoid of any detail that we find of the art works of other nations, unless we except those general geometrical formations that instinct seems to have implanted uniformly in the minds of every known race.

60. Primitiveness of Chinese Ornament.—Chinese ornament does not seem to have gone beyond the very earliest stages of design that we find among the most primitive people. They are even behind the New Zealander in

their theory of applied art, and are plodding along in the creation of fresh designs at a fixed point that is neither progression nor retrogression. Like all oriental nations, they possess a wonderful faculty of color harmony, but they have never expressed an appreciation of pure form—a condition that must necessarily be arrived at by a subtle process and result from highly endowed natural instincts, or from the development of primitive ideas through successive generations of artists, each improving on the work of its predecessor.

In their decorative and woven patterns, the Chinese possess only just such talent as might be expected of a most primitive people. Their most successful efforts are those in which a geometrical pattern forms the basis of a design, and even in these they depart from patterns formed by the intersection of equal lines, and seem to have a very imperfect idea of the distribution of space.

Their taste for color, which amounts almost to an instinct, enables them in some measure to balance form, but in designs deprived of color they seem to be almost helpless. The Chinese are certainly colorists, and are able to balance with equal success both the fullest tones of color and the most delicate shades. They are not only successful in the use of the primary colors, but also in the secondaries and tertiaries, and they are particularly deft in their management of the lighter shades of pure color, such as pink, light blue, pale green, etc.

61. Lack of Idealism in Chinese Ornament.—In their printed paper hangings, the treatment of both figures and landscape and of ornament is so conventional that, no matter how inartistic we may consider it, we feel that it is within the bounds of decoration. In all cases, their instinct thus restrains them within the true limit, and although the arrangement is generally unnatural and inartistic, they never by shades or shadows violate consistency, as is repeatedly done in work at the present day.

In their floral patterns, they always observed natural laws

of radiation from the parent stem, and tangential curvature. It could not very well be otherwise with a people like the Chinese, whose strongest peculiarity is their fidelity in copying, and hence we must infer that they are close observers of nature. It is the taste to idealize on this close observation that is wanting. On the whole, Chinese ornament is a very faithful expression of the nature of this peculiar people. Its characteristic feature is oddness. We cannot call it capricious, for caprice is a playful wandering of a lively imagination; but the Chinese imagination is disorderly, and all their works are wanting in the highest grace of art, namely, idealism.

62. Dearth of Chinese Architecture.—The extreme fancifulness of Chinese ornamental compositions, and the lack of order or method in them, is not surprising when we take into consideration the fact that the Chinese have never developed anything worthy of the name of architecture in the true sense of the word. They have no original form of construction that would be likely to give rise to a system of ornament in which even the most insignificant designs have been known to assume character and even grandeur, as is so well exemplified in Egyptian style.

63. The absence of a national architecture renders the character and genius of the Chinese easily understood. To this people, that seems to occupy itself with naught but details in everything, the conception of a monumental building is entirely beyond comprehension. Certainly, this circumstance is largely responsible for the condition of the Chinese today and the rudimentary character of their designs.

The first element of beauty in the Chinese school of art is variety, and in their foliated designs we find leaves following one after another bearing not the slightest resemblance to one another. One panel of a screen painted with a landscape will be set beside another ornamented with metallic arabesques. The use of straight lines and right angles is

either studiously avoided or so disguised that they will be vague or misunderstood.

64. Chinese Coloring.—That the Chinese imagination is of a disorderly character is shown in some of their curiously shaped forms; these are so entirely different from those with which we are more familiar, and so completely destitute of the elements that cause an impression of grandeur, that the interest in their designs is with difficulty maintained. The Chinese are apparently ignorant of the simplest laws of perspective, and seem in no way to comprehend the effect of light and shade. Notwithstanding this inferiority, however, the coloring of their ornament is so rich, and their imagination is so wild and irregular, that they make a varied and charming use of their ornament in particular applications, such as ceramics, incrustations, and woven fabrics. Their productions are models of color harmony, and are in some respects superior to the works of other nations. The very defects in their designs form sources of some of the good qualities that accompany them, and the capricious activity of their minds inclines them to make an ornament of everything, whether it be a cloud, wave, shell, rock, or form from the animal world. The bright-colored butterfly flitting among flowers and the flaming thunderbolt bursting from the heavens are of equal importance to the Chinese artist when applied to a surface as ornament.

To these rich and varied resources may be added a limited number of time-honored figures that, to a certain extent, have symbolical significance. We are all familiar with the Chinese dragons—those monsters with frightful heads, formidable looking teeth, and fearful claws—certain funny looking dogs with claws, sharp teeth, and curling mains somewhat resembling the lion, grotesque birds, and the mandarin duck, all of which are conspicuous in Chinese decoration.

65. Adherence to Standard Forms.—A peculiar characteristic of this art is that, though it appears in itself so

capricious, its execution expresses such faithfulness of transmission in the representation of things from generation to generation that the lapse of hundreds of years has not caused the slightest modification of one of these standard ornaments. This may be due to the effect of the imitative instinct of this isolated nation that, so advanced in some points and so primitive in others, is always consistent in itself. It is possible, however, that this fidelity in the observance of the form and coloring of some preceding work is due to some mysterious rules—some sort of ritual perpetuated through various ages. Ancient laws and customs established certain rules governing the color of the robes and vestments of the imperial court, according to different dynasties; once it was white, afterwards green, and the Tai Tasig dynasty, now reigning in China, dresses in yellow.

Chinese art is a mixture of ideal and imitative elements, the latter being used in the most conventional manner, the coloring of which is also conventional and not in the least subject to any imitation of nature.

66. Japanese Art, though borrowed from the Chinese, possesses much greater individuality and is better preserved to the present day. The Japanese have developed the study of nature, especially in birds, with more truthfulness and power of observation than did their ancestors or rivals, and their imitative style is therefore less conventional. However, even though their delicate productions have added fresh charms to the old Chinese ceramics, they are not equal to the figures of the work of the finest periods.

One of the principal causes of the general progress of Japanese art may be found in the fact that a great profusion of examples of design of all sorts, conceived by good artists and carved in wood, are so distributed as to be constantly before the general public. Therein lies an element of progress, as it cultivates a taste for objects of art among the common people and creates a demand. When all objects and utensils of service and utility are richly carved and

decorated with ornamental designs, the eye is bound to become educated and the general taste of the people more refined. This is strongly exemplified in the Egyptian civilization.

INDIAN ORNAMENT.

67. Unprogressiveness of Indian Art.—Although less isolated than China, and in more frequent communication with the rest of the world, Indian civilization has not experienced such changes as mark the history of many other nations. The social and religious organizations, the priests, and castes of people, the sacred books and poetry, and the manners, customs, and superstitions remain today much as they were among the Hindus hundreds of years ago.

Art naturally has shared in this standstill, and the substance of Indian decoration is still limited to a few general features that for many centuries have undergone no fundamental alteration. The most striking of these characteristics are the continuity and abundance of decoration. The surface decoration is usually filled up entirely with a profusion of ornamental forms that, if not exactly alike, are very similar. The ground color is always warm and harmonious—occasionally light, though more frequently dark—which serves to unite the designs and add greatly to the general effect.

68. The method of distribution and the admirable feeling for color procures in Indian decoration a richness and calm that gives it an undefinable sense of repose. The tendency of the style toward monotony is overcome by this powerful unity that leaves no room for desire or need of greater variety. The designs are usually based on some floral type and are treated in a most conventional manner, and though the imitation bears a closer resemblance to nature than in most of the styles we have studied, it is by no means servile. The type from which an ornament is derived can usually be recognized without trouble, and, although floral ornament is occasionally seen under the pure art form

characteristic of the Egyptian style, it is usually treated with a pliancy of execution and picturesqueness of idea that brings it to a closer resemblance to the modern style.

69. In the execution, however, Indian art never attempts the rounding of a form (a process that is naturally opposed to the idea of surface decoration), and usually confines itself to silhouette drawings, in which the outline is shown off by a dark tint on light grounds or by a lighter tint on dark grounds.

70. Characteristics of Indian Ornament.—Indian ornament possesses the valuable characteristic of being distinctively original. It has been allowed to grow up and develop itself without any foreign influence or conflicting ideas of religion. In the application of ornament to the various portions of an object, the greatest judgment is, in this style, always shown. In the first place, the ornament is always in perfect scale with the position that it occupies. On the long narrow necks of the hookas are the small pendant flowers, as shown in Fig. 50, while the swelling form toward the base is occupied with larger patterns.



FIG. 50.

71. In the equal distribution of surface ornament over the grounds, this nation exhibits a remarkable perfection of drawing. An exact balance is obtained between the various colors used, and this balance is carried to such a nicety that it is practically impossible to reproduce any of their woven or embroidered goods with any degree of accuracy. In all their woven fabrics, the colors are so fused together that the entire piece of goods at a little distance presents no individual coloring, but a neutralized bloom.

72. The following general rules observed in the designs of their woven fabrics are of importance:

1. When gold ornaments are used on a colored ground, or where gold is used in large masses, there the ground is darkest. Where gold is used more thinly, the ground is lighter and more delicate.

2. When gold ornament is used alone on a colored ground, the color of the ground is carried into it by ornaments or hatchings worked on the ground colors in the gold itself.

3. When ornaments in one color are on a ground of contrasting color, the ornament is separated from the ground by an edging of a lighter color to prevent all harshness of contrast.

4. When, on the contrary, ornaments in a color are on a gold ground, the ornaments are separated from the gold ground by an edging of darker color to prevent the gold from overpowering the ornament.

5. In other cases where varieties of color are used on a colored ground, a general outline of gold, of silver, or of white or yellow silk separates the ornament from the ground, giving a general tone throughout.

73. In Fig. 51 is shown a diaper pattern taken from an Indian textile, and exhibits the regularity of repeated form



FIG. 51.

that thoroughly fills up the surface, as heretofore described. There is a slight tendency toward a geometrical formation

observable in this pattern, where the wavy line becomes tangent to its neighbor. This geometrical pattern is not as rigidly carried out, however, as in Fig. 52, where the construction lines governing the main details consist merely of semi-circles connected by short straight lines, thereby forming knees, as indicated at *a*. The style of ornament enclosed in the geometrical figures thus formed is typical of Indian design, and shows a number of forms tangent to a general stem, all of which may have had their origin in brush strokes of painted work, or possibly in the shape of the palm leaf, which they slightly resemble.



FIG. 52.

74. In Fig. 53 is shown a typical example of Indian ornament taken from a woolen fabric, many of the details of



FIG. 53.

which will be found similar to the strokes referred to in

Fig. 52. These forms, though more or less foliated, do not bear a very strong resemblance to the natural type, but in Fig. 54 we have an example of silverware where the chased design is a conventionalized form of flower, but in more direct imitation of nature than exhibited in the other examples.

75. These few examples illustrate by comparison the different handling of ornament by the Indian designers to suit it to various purposes. The patterns shown in Figs. 51 and 52 are seen more usually in light fabrics, while that in Fig. 53 is woven in heavier woolen goods, and that in Fig. 54 is executed in metal.

In objects of low-tone combinations of color, a black general outline is used to separate the ornament from the ground. The object always appears to be, in the woven fabric, that



FIG. 54.

each ornament should be softly and not harshly defined, that colored objects viewed at a distance should present a neutralized bloom, that nearer approach should exhibit the beautiful details, and that a close inspection should divulge the means whereby these effects are produced. In this, the Indian carries out the same principle of surface decoration that we find in the architecture of the Arabs and Moors. The ornament in the spandrel of a Moorish arch and in an Indian shawl are constructed on precisely the same principles.

76. Indian decoration, like the Chinese, is unprogressive and introduces no new forms in its designs, but repeats traditionally generation after generation the same forms for the same purposes.

ARABIAN ORNAMENT.

77. Important as was the influence of Byzantine art in Europe from the sixth to the eleventh century, there was no people that it affected more than the great and spreading Arab race that propagated the creed of Mohammed, and, after conquering the finest countries in Asia and Africa, finally obtained a footing even in Europe. In the earlier buildings executed by them in Egypt, Palestine, and Spain, the influence of the Byzantine style is very strongly marked, and the tradition of the Byzantine school affected all the adjacent countries to a greater or less degree.

Although the Arabs must have possessed an original art, only a few traces of it remain, and these are in legends wherein grand buildings are spoken of that date back to remote antiquity.

It is known that the wandering and stationary tribes distinguished each other by the name of "Felt people" and "Clay people," and this would lead one to the impression that the latter title implied a knowledge of ceramics; but the character of the decoration of the pottery of these early tribes is at present unknown, as is also that of their arms, fabrics, and fixed dwellings.

78. Development of Arabian Ornament.—On their contact with the Greeks, East Indians, and Persians, the Arabian people produced a style of ornament that formed an important part in the compromise now called by the name Byzantine. Subsequently, when Byzantine art had reached its zenith, Arabian art, under the influence of Islam, took the form under which we now know it, and may have shown in some applications a certain Byzantine influence exercised on the Arab practice. It is unreasonable, however, to consider

Byzantine art, as is sometimes done, as being originally a formation of the Arab style, as the latter has too much character and unity not to be in itself an original conception. There appears to have been a mutual influence exercised between the Byzantine and Arabian during the earliest periods, as inevitably happens in a contest for supremacy between two neighboring styles; but if the Arab received anything from the perfected Byzantine, it may be said that they were only partly taking back their own from an art that had drawn so largely from oriental sources, not only during its formation but also up to the period of its greatest development.

79. Influence of Mohammedanism.—When the Mohammedan religion spread with such astounding rapidity over the East, the increasing demands of civilization naturally led to the creation of a new style of art, and while it is certain that the early Mohammedan structures were either an adaptation of old Roman or Byzantine buildings, or else buildings constructed from the ruins and materials of the ancient monuments, it is equally certain that the new ideas and expression of feelings must at a very early period have given rise to a characteristic form of art. In buildings constructed largely of old materials, they endeavored to imitate the details borrowed from old buildings, and the same result followed that had already taken place in the transition of the Roman style to the Byzantine. The imitations were crude and imperfect, but this imperfection created a new order of ideas; and instead of returning to the original model, they gradually threw off the restrictions, and early in their history formed and perfected a style of art peculiarly their own.

80. With the study of Arabian ornament, we meet the first restrictions in the application of certain forms in decoration. The Mohammedan religion forbids the use of any animal or vegetable forms as an element of design. The Koran, which occupies the same position in the Mohammedan belief that the Bible does in the Christian, distinctly states that the follower of Mohammed "Shall make no

images." We therefore find in the Arabian style, as a substitute for the foliated design we are now so familiar with, a system of constructive ornament, the complicated framing of which was fascinating to the geometrical mind of the Arab.

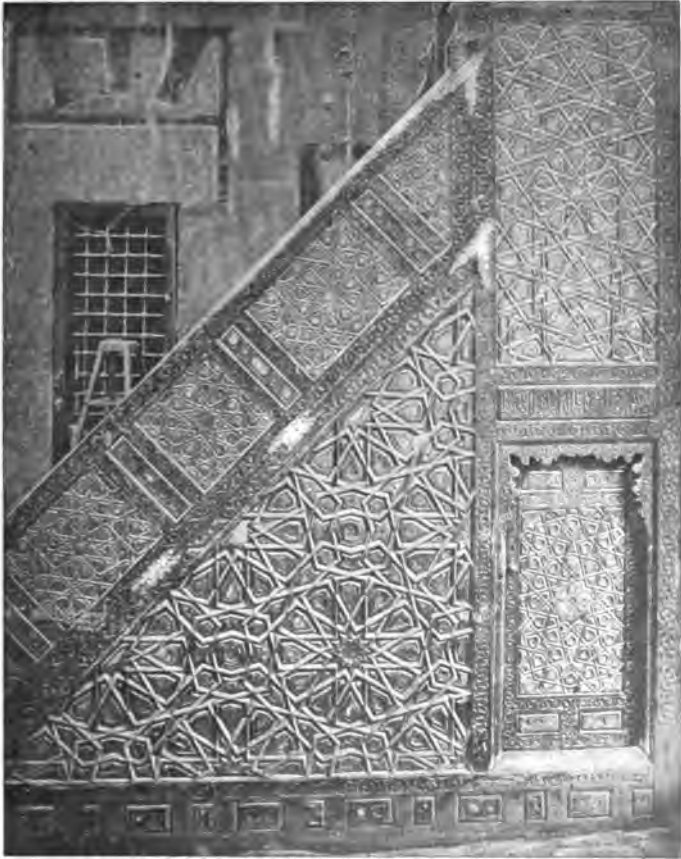


FIG. 55.

81. This is shown clearly in Fig. 55, which is the outside of a staircase in Egypt, the panels of which are enriched by very beautiful geometrical devices—complicated in their construction but really simple in their formation when their

governing lines are traced out. Take, for instance, the large triangular panel, and it will be found that all the figures therein are formed by the intersection and crossing of a number of zigzag lines, several of which are exactly the same in pattern but arranged at different angles.

This is characteristic of all Arabian and Moorish designs, as we shall see hereafter. The continuity of the ornament entirely covers the surface in Arabian as in Indian art, and nothing can be removed from the design without occasioning a feeling of loss.

The means employed, however, are different, and, while the mere repetition of objects frequently suffices in Indian decoration, the Arabian ornament, on the contrary, is built up and bound together in all its parts. Everything is connected, and, from the circumference to the center of the interlacings in a piece of rose work, there is a continuous line that cannot be broken without destroying the design. This imaginative construction is sometimes double, that is, formed by two complete systems that follow each other to an end without confusion, but meet and overlap to produce incidental figures, intersections, and alterations.

82. Arabian Decoration. — Notwithstanding this learned complication, Arabian decoration is clear and distinct, thanks to the general purity and fineness of the lines and the exclusion of all superfluity. This is also due to the principle observed in the construction of the “roses,” wherein the wider spans are reserved for the extremities of the circumference, leaving to the radiating center, from which they diverge, the fine work that throws out boldly, thus fixing the eye on the key of the whole composition as the central point of a circle.

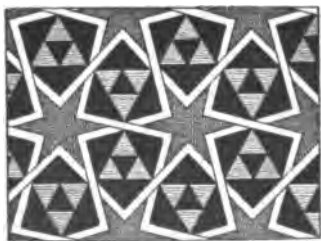


FIG. 56.

83. In Fig. 56 is shown another example of this style of ornament, taken from a mosaic

pavement in a mosque at Cairo, in Egypt. Here the geometrical simplicity of the pattern can be easily traced, as the design consists simply of two horizontally arranged zigzag lines, crossed at regular intervals by sets of diagonally arranged zigzag lines, the patterns of which are all identical.

84. In Fig. 57 we have an ornament generated on a different system but on a similar geometrical idea. This ornament, too, is suggestive of the fret pattern, though entirely different from any frets we have hitherto observed. However, the shape of the enclosed figure *abcdef*, it will be

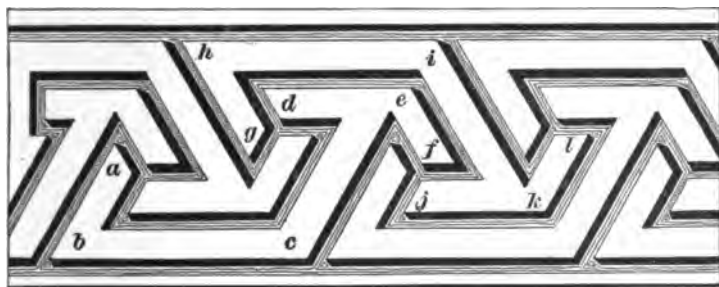


FIG. 57.

observed, is identically the same as the figure *ghijkl*, and the repetition and alternate arrangement of these two peculiar outlines give us the key to the whole system of ornament shown in the figure.

This result is obtained by an arrangement of the simplest forms imaginable, but the geometrical and intellectual study required to perfect these forms to bring about the result is something tremendous, and the student will readily see that it really requires more brain work to produce a simple looking design like Fig. 57, than the complicated arrangement of straight lines shown in Fig. 56.

85. Another pattern is shown in Fig. 58, and consists of a number of scrolls of a more or less geometrical character,

and, though simple in itself, it is fascinatingly complicated in its conception. The design is executed in two colors, and a little study will show that the outlines of the two colors are identical. The light portions of the design in the upper half of the figure are a duplication of the dark portions of the design in the lower half of the figure, and vice versa, every detail on one half being exactly reproducible in the opposite color on the other half, and, if the figure were sawed out on the line dividing the two colors, it would produce two outlines

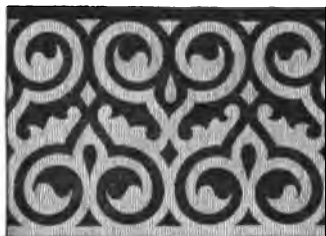


FIG. 58.

exactly the same in every respect. We called attention to this fact in connection with the Greek frets, but no Greek ornament ever carried this wonderful mathematical detail to such a nicety.

86. Arabian Coloring.—In Fig. 59 we have a ceiling taken from a mosque at Cairo. The repetition of similar forms is clearly marked here, though the geometrical element is largely lost owing to the surface covered by the flat decoration. The colors here used were a light blue for the groundwork, over which was laid the general design in bright gold, and that overlaid with a pale yellow, almost approaching a cream tint. Light blue and



FIG. 59.

are very prominent tints in Arabian ornament; red is used but sparingly, and then of a most intense shade; while green is introduced in small arabesque figures, scattered through with others of gold and occasionally of blue. The ground colors in nearly all instances are blue, creamy yellow, and occasionally red.

87. Fig. 60 is from an illuminated copy of the Koran, and illustrates the influence of Byzantine art on that of Arabia. The general construction lines of the ornament are Byzantine in character, while the filling in is typically Arabian. The small irregular spaces in the border of the design



FIG. 60.

at *a* are green, the square enclosed spaces at *b* are a brilliant red, and the groundwork that shows through at *c* is a delicate shade of blue. The ornaments worked on these grounds and in these spaces are either a bright gold or white, and the filling in of the general outline is a creamy shade of yellow.

88. In the primitive Arabian style, unmixed with the Persian, the flower, properly so called, is never to be found, but in its place appear other forms resembling it and are apparently inspired directly by nature. This sort of subject, half way between imaginary conception and the representation of natural flowers, does not appear simply as a termination of scrolls, as among the Greeks, but forms an integral part of the decoration and does not break the lineal network.

TURKISH ORNAMENT.

89. Characteristics of Turkish Ornament.—The architecture of the Turks, as seen at Constantinople, is patterned after the early Byzantine style, though their system of ornamentation is a modification of the Arabian style. In fact, it may be considered as an application of Arabian ornament, without any understanding of the meaning, derivation, or type of that ornament.

When the art of one people is borrowed by another of the same religion but of different character, temperament, and customs, the resulting designs are certain to show the deficiency of intellect or refinement that the borrowing people possessed in contrast to the others; and this is the case with the Turks when compared with the Arabs. There is the same difference in the refinement, elegance, and judgment of the Turkish ornament and Arabian ornament as there is between these two peoples. The Turks themselves can hardly be considered an artistic nation. They have built buildings and executed designs in their cities, but have employed foreign artists to do the work. All their public buildings, therefore, present a mixed style. It is not at all unusual to find in a Turkish building floral ornaments of Arabian and Persian origin side by side with details from Rome, the Turks having exhibited a tendency to abandon the traditional style of their forefathers.

The Turks are the first of the Mohammedan nations to adopt European fashions in architecture, and their modern buildings and palaces are the work of European architects and artists, and are designed in the most approved European style.

90. The Turkish embroideries give about the only style of ornament that we can consider strictly national, as work of this character must necessarily exhibit the characteristics of the race, and, judging from this, it will be readily seen that their art instinct is far inferior to that of India. Indian embroidery is perfect in the distribution of its forms and all

its principles of ornamentation. With Turkish ornamentation, the only examples we have that approach any degree of perfection are in the carpets, but these are executed mostly in Asia Minor, and are probably not designed by Turks. The designs of most of them appear more Arabian, and differ from the Persian carpets in being more conventional in their foliage treatment.

91. The general principles of the distribution of form are the same in Turkish and Arabian ornament, but there is a difference in the treatment. In both the Arabian and Moresque styles, the surface of an ornament is only slightly rounded and the enrichment is secured by sinking in the lines, or, where the surface was left smooth, additional pattern upon pattern was obtained by painting. Turkish ornament, on the contrary, presents a curved surface, and the effect is not as broad as that produced by the sunken-feather treatment of the Arabian and Moresque. Another peculiarity that readily distinguishes Turkish ornament from Arabian is its abuse of the reentering curve, thus causing all its detail to have a feeling of instability and unrest. This is also, to a certain extent, characteristic of the Persian style. In the Moorish style, however, it appears only exceptionally.

92. It is a very difficult matter, in fact, almost impossible, to clearly explain the differences in styles of ornament that have so strong a family resemblance as the Persian, Arabian, and Turkish, but, after practice, the eye detects them as readily as it does the difference between Roman and Greek. The general principles remaining the same, there will be found a peculiarity in the proportions of the masses—more or less grace in the flowing of the curves, a fondness for particular directions in the leading lines, and a peculiar interweaving of forms, the general form of the conventional foliage usually remaining the same. The relative degree of fancy, delicacy, or coarseness with which these are drawn will at once distinguish them as works of the

refined and spirited Persian, the not alone refined, but reflective, Arabian, or the unimaginitive Turk.

93. The most prominent colors in Turkish ornament are green and black; in fact, these form a feature of the ornament. In modern Turkish ornament, green is much more prominent than in ancient examples, where blue was the important color.

PERSIAN ORNAMENT.

94. Characteristics of Persian Ornament.—The time at which we are most familiar with Persian art is at the period of its greatest splendor. The outlines of the ornament are generally taken from the conceptions of Arabian architecture, but modified by Indian tradition and the peculiar genius of the Persian race. The style of Persian ornament is less compressed and austere than the Arabian, and possesses more freedom and elegance, while its sources of double derivation give it a greater element of variety.

The floral motive is employed in both its aspects. In some examples it is scattered through the decoration with apparent freedom, and, in others, inserted in the linked network and usually placed at the intersection of lines; but even in the latter case, it is treated in a manner that is medium between the Arab conventionality and the Indian naturalism. A consideration of the characteristics of the Persians will help us to understand this more fully.

95. Persian Compared With Arabian Art.—The Arabs belonged to the Mohammedan sect of Omar, while the Persians had split from this faith, and belonged to the sect of Ali, and were great drinkers of wine. They therefore attributed to flowers a symbolical language, and did not exclude the representation of flowers in their decoration, which is also animated by real and fantastic animals, and sometimes, though rarely, with the human figure. The

resources resulting from this mixed style are enhanced by the manual skill and remarkable fertility possessed by the Persians. Bookbinders, potters, embroiderers, and miniature painters emulate one another in taste and skill. Persian carpets are still considered the finest in the world, and the dishes, vases, and enamel bricks from that country are models of taste, and European art seeks them out and manufacturers endeavor to equal them by imitation.

96. Persian Compared With Indian Art.—The Indian and Persian styles resemble each other in their polychromatic decoration. The rule is usually a silhouette, with geometrical outlines relieved by conventional coloring on a dominating generating ground.

97. The Mohammedan architecture of Persia never seems to have attained the perfection of the Arabian buildings in Cairo. Although presenting considerable grandeur in the main features, the general outlines are less pure, and there is a want of elegance in all their structural details compared with the edifices of Cairo. It is not strange, therefore, that we find their system of construction much inferior to that of the Arabians and Moors. The Persians, unlike the Arabs and Moors, were free to introduce animal life, and thus mixing up subjects drawn from real life with the inanimate forms of decoration, they were led away from the tendency to a pure style of ornament.

98. The great attention given to the illumination of manuscripts in Persia, which were widely spread through all Mohammedan countries, would naturally tend to spread the influence of this mixed style, and the decorations of houses at Cairo and Damascus, and the mosques and fountains of even Constantinople, are tainted with it to a greater or less extent. Groups of natural flowers are constantly found growing from vases and enclosed in panels of conventional Arabian ornament.

MOORISH ORNAMENT.

99. Derivation of Moorish Art.—The Moorish style, with but a few distinguishing characteristics, is the direct offspring of the Arabian. The methods of construction, the

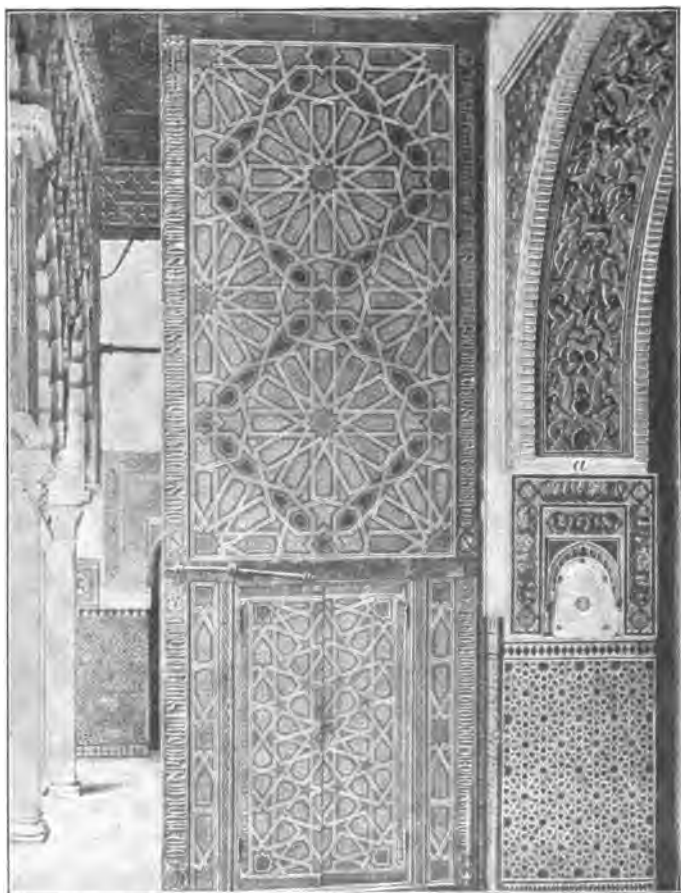


FIG. 61.

forms of ornament, and the frequent use of inscriptions are common to both styles. However, in Moorish decoration, a characteristic feature is the use of a third color, or ground

surface, worked over or between two others that serve as a framework. This may be seen in Fig. 61, which is a detail from the Alcazar, at Seville. Here the geometrical construction of the Arabian style is everywhere evident, while in the soffit of the arch at *a* is seen the typical relief Moorish ornament painted in three colors, as hereafter explained.

100. The Alhambra.—In discussing the ornament of the Moors, we will confine our illustrations largely to details taken from the Alhambra, in Spain, because this is one of their chief works of art, and the one in which their system of decoration reached its culminating point. In fact, the Alhambra occupies the same position in Moorish art as does the Parthenon in the Greek, or Hagia Sophia in the Byzantine style. Every principle of art that we find in the ornament of any other people, we find obeyed by the Moors in this erection of the Alhambra. Here are the eloquence of Egyptian art, the grace and refinement of the Greek, and the geometrical complexity and variety of the Byzantines and Arabs.

101. Characteristics of Moorish Ornament.—The ornament lacked the charm of symbolism, however, that is so characteristic of Egyptian ornament, for this was forbidden by the religion of the Moors; but its place is more than supplied by the Arabic inscriptions, which address themselves directly to the eye by their personal beauty, and not only excite the intellect by the difficulties of deciphering their complex and curious involutions, but also delight the imagination when read by the beauty of the sentiments they express and the music of their composition. Long fantastic letters, interwoven with graceful but intricate geometrical patterns, as shown at *a* in Fig. 62, lead the eye to decipher the words, and we find, as a part of the construction of their very buildings, sentiments that are ever present and associated with all their daily doings, and ever simple but truthful phrases elaborately twisted or intricately woven, such as, "There is no conqueror but God."

102. The builders of this wonderful structure were fully aware of the greatness of their work. It was inserted in the inscriptions on the walls that this building surpassed

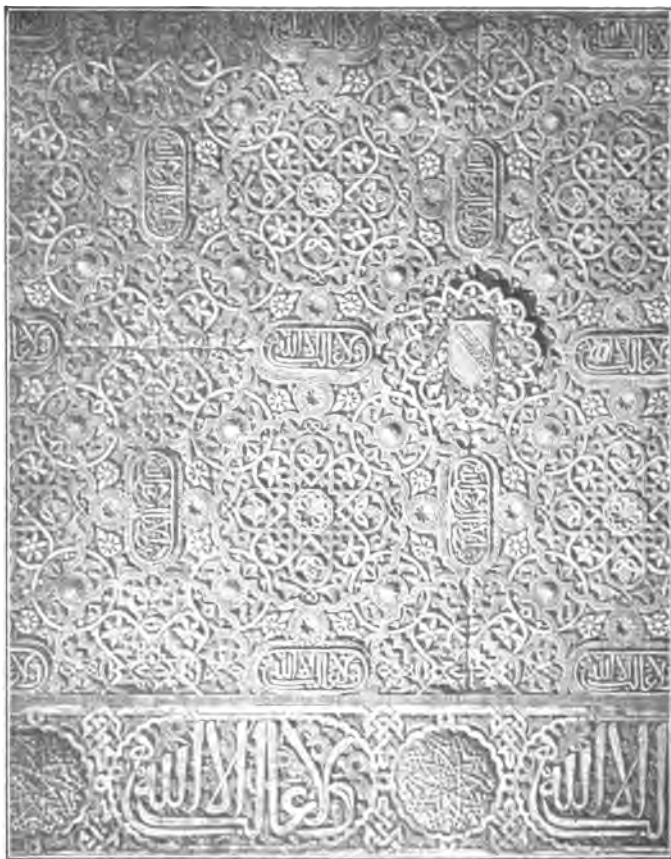


FIG. 62.

all other buildings. They also state in the glittering eccentricities of the design that, "He who stops to study with attention will reap the benefit of a commentary on decoration."

103. Decorated Construction and Constructed Decoration.—Let us now follow the injunction of this inscription and learn some of the general principles that

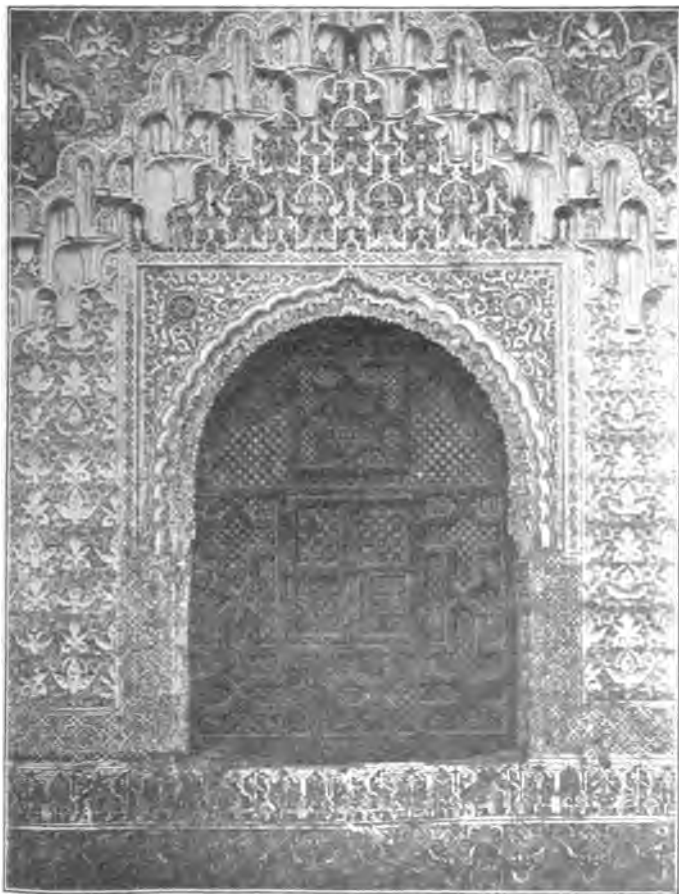


FIG. 63.

appear to have guided the Moors in their decoration. In the first place, they always regarded the first principle of architecture—to decorate construction and never to construct decoration.

In Moorish art, the decoration arises most naturally from the construction, and the constructive idea is carried out in every detail of the ornamentation of the surface, as shown in Fig. 63, which is a window opening, around which, it will be observed, the ornament is arranged to set forth and emphasize the opening as a structural detail. We have already said that true beauty results from a repose of mind, felt when the eye, the intellect, and the affections are satisfied and free from all sense of want. When a building is constructed falsely, and appears to derive or give support without doing either one or the other, it fails to afford this repose, and therefore can never pretend to true beauty, however harmonious it may be in itself.

The Moors and the Mohammedan races generally have ever regarded this rule, and we never find a useless or superfluous ornament, or one that does not arise quietly and naturally from the decorated surface. The lines grow out of each other in gradual undulations; there are no excrescences; nothing could be removed and leave the design as good, or make it any better.

104. The surface in Fig. 64 is entirely filled with ornamentation, but no detail of it can in any way be altered and so improve the design. In a general sense, if its construction is properly attended to, there can be no excrescences. The general forms were first cared for; these were subdivided by general lines, the interstices of which were then filled with ornament that was again subdivided and enriched for closer inspection. (This will also be observed by careful study of Fig. 60.) They carried out this principle with the greatest refinement, and the harmony and beauty of all their ornamentation derived their chief success from this observance; their main divisions contrasted and balanced perfectly. The detail never interferes with the general form, and, when seen at a distance, the main lines strike the eye and the fine detail disappears; nearer approached, more detail comes into the composition, and, on close inspection, all detail of the surface appears as a grand powdering of ornament. The

effect of this treatment is well illustrated in Fig. 65, where the general arched construction is the main consideration. The subdivision of the surface into general panels by means of ornamental bands is of next importance, and the surface

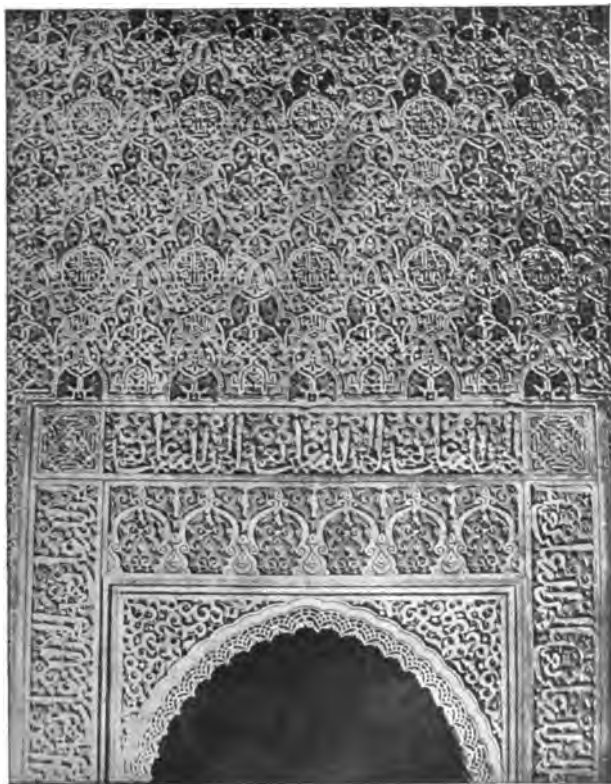


FIG. 64.

decoration of these panels then receives the final consideration. However, though these may be left to the last, they receive the closest attention and a care in their treatment not even second to that in the construction of the arch itself.

105. The Primary Elements.—Harmony of form appears to exist in the proper balancing and contrast of the

straight, inclined, and curved elements; as in color there can be no perfect composition in which either of the three primary colors is wanting, so in form, whether structural or decorative, there can be no perfect composition in which

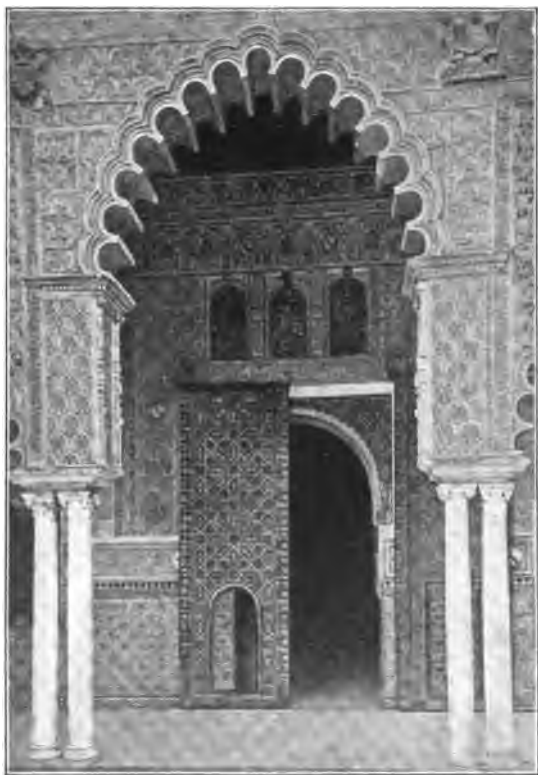


FIG. 65.

either of the three primary elements is wanting, and the variety of harmony in a design depends on the predominance or subordination of these three forms.

106. In surface decoration, an arrangement consisting of straight lines crossed by other straight lines, as in Fig. 66,

is monotonous and affords no feeling of satisfaction. This is because only one of the primary elements is present—the straight line; but, if we introduce lines that tend to carry the eye toward the angles, as in Fig. 67, the pleasure is increased and the figure has more repose. This is due to the presence

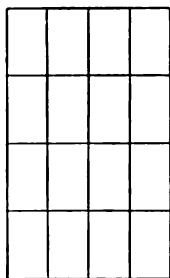


FIG. 66.

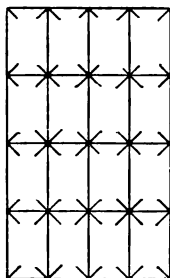


FIG. 67.

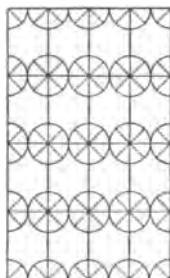


FIG. 68.

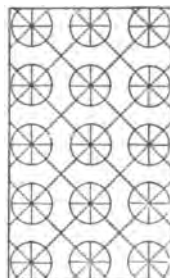


FIG. 69.

of another primary element—the inclined line. Now, add the third element—the curved line—as shown in Fig. 68, and the figure expresses complete harmony. In this case, the straight line or square is the leading form and the others are subordinate, but the same result can be obtained by making the inclined line the leading form, as shown in Fig. 69.

107. It is the neglect of this simple rule that causes so many failures in paper hangings and carpets, and more especially in articles of dress. The lines of papers generally appear to run up through the ceiling most disagreeably in one direction only, carrying the eye right through the walls of the apartment.

The study of any design or pattern that has been regarded with any degree of satisfaction in ancient times, will show, as component parts of its structure, the straight line, the curved line, and the inclined line characteristic of the surface decoration of the Moors.

108. Consistency of Moorish Ornament.—In the decorative art of the Moors, all lines flow out from a parent

stem. Every ornament, no matter how remote, can be traced to its branch and root. An ornament is so adapted to the surface decorated that it often appears to suggest the general form rather than to have been suggested by it. In all cases where foliage flows out naturally from a parent stem, the eye is never offended as is done by modern practice in the random introduction of ornament without reason for its existence.

However irregular the space they have to fill, the Moors commence by dividing it into equal areas, and around these they fill in their detail, but invariably return to their parent stem. They appear in this to work by a process analogous to that of nature.

109. Take, for instance, the leaf of a vine, the object here being to distribute the sap from the parent stem to the extremities; it is evident that the main stem should divide the leaf as nearly as possible into equal areas. So again with the minor divisions, each area is then again subdivided by intermediate lines that all follow the same law of equal distribution, even to the most minute filling in of the stem feeders.

110. The Moors follow another principle—that of radiation from the parent stem—as may be seen in a chestnut leaf, wherein the leaflets all radiate from the parent stem, each leaflet diminishes in size toward the extremities, and each area is proportionate to the leaf.

The Orientals carried out this principle with marvelous perfection, as did the Greeks in their honeysuckle ornament. A great difference between the Greek ornament and that of the Arabian and Moresque, however, is that the former grows its ornament scroll out of scroll as before explained, and the latter grow their ornaments off from each side of a continuous stem. With the Moors, all junctions of curved lines with curved lines, or curved with straight, are tangential to one another.

111. Conventionalism in Moorish Ornament.—A charm found in the works of the Arabs and Moors lies in

their conventional treatment of ornament. Their creed forbade them to represent living forms, and, therefore, they could not let their art decline to realism even though they so desired. They worked on the same lines that nature worked, but always avoided a direct transcript; they took her principles but they did not copy her works.

112. Coloring in Moorish Ornament.—The coloring of the Moorish ornaments was treated as skilfully as was the form. They followed certain fixed principles founded on observations of natural laws. The colors employed on their stucco work were in all cases a combination of the three primaries—blue, red, and yellow, the last being represented by gold—and the secondary colors—purple, green, and orange—occurred only in the mosaic dados. These, being nearer the eye, formed a point of repose from the more brilliant coloring above.

113. It may be remarked here that among the Egyptians, Greeks, Arabs, and Moors, the primary colors were used exclusively in the earliest period of the arts, and, during the decadence, the secondary colors were used. Thus, in Egypt, the temples of the Pharaonic period were painted entirely in primary colors, while those in the Ptolemaic period used the secondaries. The early Greek temples were decorated in the primary colors, while at Pompeii every variety of shade possible appears. In modern Cairo, and in the East generally, we have green appearing frequently side by side with red, where blue would have been used in the earlier times. This is equally true of the works of the Middle Ages. In the early manuscripts and in stained glass, the primary colors were chiefly used, although other colors were not entirely excluded, while, in later times, every variety of shade and tint is used indiscriminately, with preference for none.

114. In Moorish art, the primary colors were used in the upper portions of the design, and the secondary and tertiary colors on the lower portions. This is entirely in accordance with natural law. We have the primary blue in the sky, the

secondary green in the trees and fields, and the tertiaries in the earth itself. It is also observable in flowers, where the primary colors are the buds and flowers, and the secondaries are the leaves and stalks.

115. The ancients always observed this rule in the best periods of art; though in Egypt we do occasionally see a secondary green used in the upper portions of a temple, but this arises from the fact that all ornament in Egypt was symbolic, and if a lotus leaf were used in the upper part of a building, it would necessarily be colored green. The law is true in general, and the aspect of an Egyptian temple of the Pharaonic period usually gives the primaries above the secondaries, while, in the Ptolemaic period, the order was inverted. In Pompeii, we occasionally find in the interior of the houses a gradual coloring, from the roof down, of a light to a darker color, ending with black, but this was by no means universal.

116. System of Moorish Coloring.—The system of Moorish coloring might be considered absolutely perfect. All the surfaces were modeled and proportioned according to the color they were to receive, and, in using the colors blue, red, and gold, they took care to place them in such positions that they should be best seen themselves and add most to the general effect. On molded surfaces they placed red (the strongest color of the three) in the depths, where it might be softened by shadow, and never on a raised surface; blue was placed in the shade, but not deep shade; and gold on all the surfaces exposed to strong light, for it was evident that by this arrangement alone could their true value be obtained. The several colors are either separated by white bands or by the shadow caused by the relief of the ornament itself, and this seems to be an absolute principle required in coloring—colors should never be allowed to impinge on one another.

117. In Fig. 70, the background *a*, on which the ornament is placed, was of a deep-red color, while the leaf forms *b*

were colored with the primary blue. All the rest of the surface, including the necks of the columns, was gold, and a grand harmonious bloom was spread over the whole design.



FIG. 70.

118. Blending of Colors.—In coloring the grounds of the various diapers, the blue always occupies the largest area, and this is in accordance with the theory in optics and the experiments that have been made with the prismatic spectrum. Rays of light are said to neutralize one another in the proportion of 3 yellow, 5 red, and 8 blue. Thus, it will be seen that a quantity of blue equal to the sum total of the required quantity of red and yellow will produce an effect of harmony and prevent the predominance of any one color

over the others. In the Alhambra, yellow was replaced by gold, which tended toward a reddish yellow, and the blue on

this account was further increased in proportion, to counteract the tendency of the red to overpower the other colors.

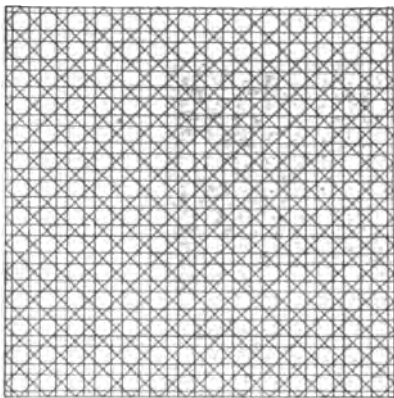


FIG. 71.

119. Moorish ornament is governed by certain geometrical patterns in its formation, although the number of these patterns is small. In Fig. 71 is shown an interlaced pattern consisting, *first*, of vertical and horizontal lines arranged

in pairs, the distance between each pair being twice the distance between the lines composing each pair; *second*, of diagonal lines drawn through the pattern at an angle of 45° , and spaced a distance apart equal to the vertical and horizontal pairs. The diagonal lines are arranged so that the set of squares formed by their intersection will contain in their centers the intersection of the vertical and horizontal pairs.

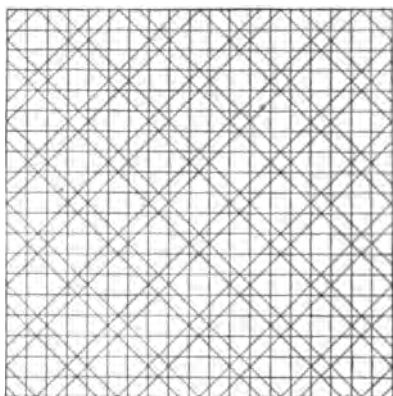


FIG. 72.

120. In Fig. 72 is shown a slight variation of this same interlaced pattern, wherein the vertical and horizontal lines are drawn singly and the diagonal lines are drawn in pairs, but of

slightly different proportion from Fig. 71. The amount of Moorish ornament that can be developed from these two figures is unlimited, and the Moors themselves extended even this limit by the variety of coloring in the different parts.

Figs. 73 and 74 are based on the system shown in Fig. 71, and Figs. 75 and 76 are developed from the system shown

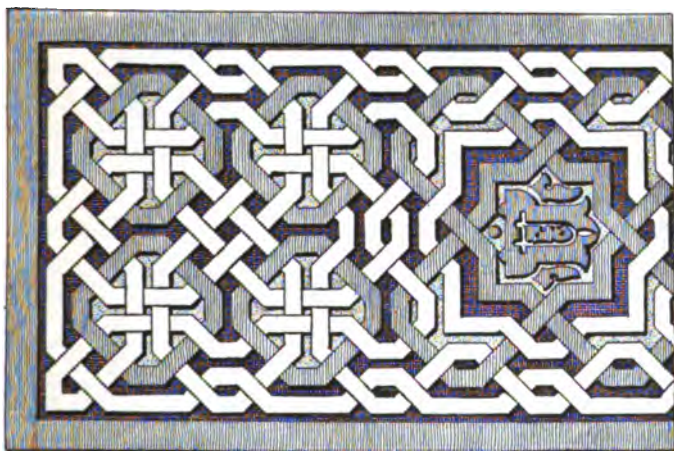


FIG. 73.

in Fig. 72. A slight variation of the systems themselves will produce most remarkable results in the figures.



FIG. 74.

121. However much disguised, the whole ornamentation of the Moors is constructed geometrically. Their

fondness for geometrical forms is evinced by the great use of mosaics, in which their imagination had full play.



FIG. 75.

However complicated may be their patterns, they are all extremely simple when the principle of setting them is

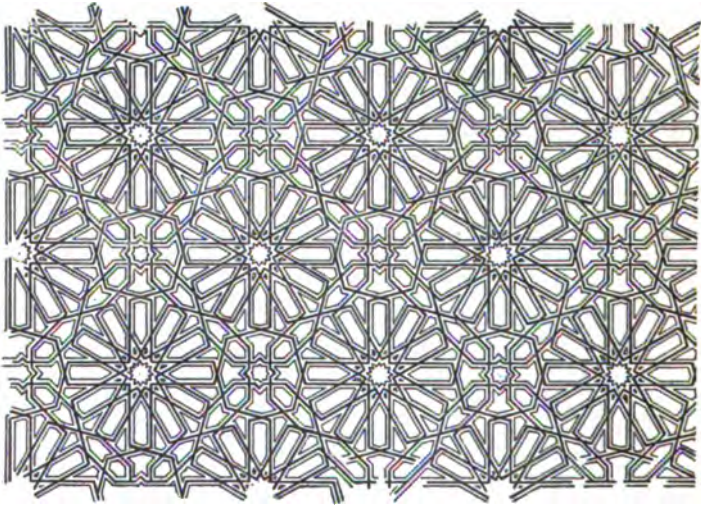


FIG. 76.

once understood. They all arise from the intersection of equally distant lines around fixed centers.

WESTERN ART.

CELTIC ORNAMENT.

122. Origin and Character.—In studying the ornament of Western Europe, we follow a chronological order instead of an ethnological one, as we have been doing heretofore, the history of ornament in this section being progressive and free from outside influences except to a very limited extent.

When Byzantine art spread over Western Europe, as it did about the twelfth century, it must have found among the nations of Celtic origin an indigenous art, arising from the peculiar aptitudes of that race. The Celts undoubtedly had a spontaneous national art, though its birthplace, whether in Scandinavia or Ireland, has never been satisfactorily decided.

123. Interlacing forms almost the only element of the Celtic designs of the earlier period, and this establishes its antiquity, for the intertwining ornament is essentially a primitive style. Its distinctive mark is the division of the surface, decorated by such a combination of lines that the development is usually happy, possible, and logical, and there is no doubt that the origin of these designs was procured originally from interlaced cords. The pliability of this original type would account for the curved instead of acute angles, this being a characteristic difference between the Celtic and Arabian geometrical designs.

124. The variety of productions obtainable from such simple elements is remarkable. In many of them the complications prove, by their skilful divisions, and the ingenuity of the windings, a practical comprehension of ornamental construction. There is lacking, however, in this style, a vital element—the element of more extensive representation—and its resources were threatened with exhaustion from

having used every possible combination of the intertwinings of a cord.

125. Introduction of Animal Forms.—In combination with Byzantine art, Celtic ornament advanced in style. A portion of the original interlacings was still retained, and for the discarded part was substituted the stem from which sprang the leafwork and terminated in floral spans.

Having thus attained some decorative richness, the Celtic style rose to the level of art; at the same time, the difference already mentioned between it and purely geometric conceptions, such as are usually found in Arabian decorations, became more striking, from the frequent introduction of the heads of quadrupeds and birds, serving as terminals to some of the principal lines that were made to represent bodies elongated out of all just proportion or probability, and from which emerge feet and claws corresponding with the head. Such as they are, these fantastic and grotesque images constitute a separate art that the interlacings alone could never have reached.

126. Distinguishing Characteristics.—The chief characteristics of the early Celtic style consist : *first*, of the entire absence of foliage or other vegetable ornament; *second*, the extreme intricacy and excessive minuteness and elaboration of the various patterns, most of which are geometrical, consisting of interlaced ribbon work, diagonal or spiral lines—each of which invariably wove itself alternately above and below each successive transverse strand—strange, monstrous animals, and birds with long topknots and tongues and tails intertwining in almost endless knots. Some of the manuscripts have entire pages covered with elaborate patterns in compartments, the whole forming a beautiful cruciform design, and one of these facing a commencement of each of the four gospels.

The labor employed in such a mass of work must have been immense, the care most infinite, as a critical

examination with a magnifying glass does not detect an error in the truth of the lines or the regularity of the interlacings; yet with all this minuteness, the most harmonious effect of coloring has been produced.

127. Intricacy of Design.—Of the curious intricacy of some of these designs an idea may be obtained by following a ribbon in one of these patterns, as, for instance, in the upper compartment of Fig. 77. The method adopted to secure this intricate



FIG. 77.

interlacing, so that each strap shall alternately cross above and below each following one, can be better understood

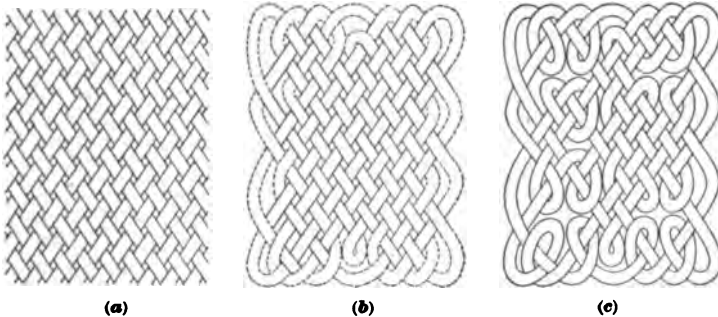


FIG. 78.

by reference to Fig. 78, where the preliminary arrangement of a woven pattern is laid out at (a) and the turning and joining of its exterior ends are shown at (b), while

at (c) is seen the completed interlacement and complication of interior curves and returnings.



FIG. 79.

Sometimes two ribbons run parallel to each other, but are interlaced alternately, as in Fig. 79. When allowable, the



FIG. 80.

ribbon is dilated and angulated to fill up particular places in the design, as in Fig. 80. The simplest modification of this



FIG. 81.

pattern, of course, is the double oval seen in the angles of Fig. 81. This occurs in Greek and Syrian manuscript, in Roman tessellated pavements, but rarely in Celtic manuscript.

128. Symbolism.—

No symbolic meaning seems to have been attached to the Celtic ornaments, except perhaps in the designs so frequently found without beginning or end, in which appears what might be a symbol of eternity.

The union of the Celtic and Byzantine styles did not entirely give way to the Gothic style with which it long existed. It furnished types for the finest ornamentation of glass and manuscripts, that in this period, from the eleventh to the fourteenth century, resembles stained glass on a reduced scale.

GOTHIC ORNAMENT.

129. Evolution.—Gothic art grew out of and succeeded the Romanesque in Western Europe in the same manner that the Byzantine did in the East. Each was the result of an attempt to adapt a modified Roman style to the new conditions caused by political, religious, and geographical changes. In Western Europe, however, the Romanesque style failed to develop into a new architectural system until about the middle of the tenth century, while the Byzantine became a perfect style of art before the close of the sixth century.

130. Influence of Religion.—Gothic art in every particular was directly opposed to classic art, not only because it was developed by the nations that had conquered Rome, but because it was a Christian art, in opposition to a pagan art, and its architecture was based on an economical system of construction, while that of classic Rome was an extravagant construction. Its greatest monuments were built to the glorification of the Supreme Being, while those of Roman art were for the glorification of the empire. It is not surprising, therefore, to find the best and purest examples of Gothic art in localities most distant from Rome, and, as we gradually approach the south of Europe, we find Gothic ornament tainted more and more with classic influence until, in Italy, the examples are so different in feeling and expression from those we find in England that they constitute almost an entirely different style. In France, the style is not as pure as in England, but it contains none of the extreme variations seen in Italy, and being patterned

more or less after the English examples, derives what good it has from that country.

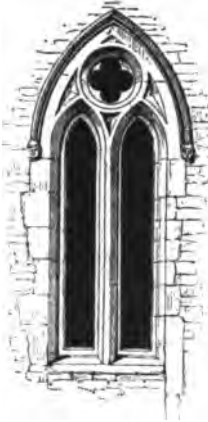


FIG. 82.

131. German and English Gothic.

In Germany, Gothic art was copied from the French, and carried the imperfections of the French style to a still lower degree, and its entrance into Italy from Germany renders its condition in the seat of the old Roman Empire so debased that it possesses none of the underlying principles of the pure Gothic style.

English-Gothic ornament may be divided into three general periods, each associated approximately with the century of its greatest development. These periods are called the *Early English*, or thirteenth century, the *Decorated*, or fourteenth century, and the *Perpendicular*, or fifteenth century.

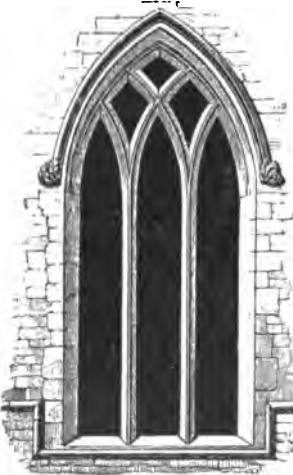


FIG. 83.

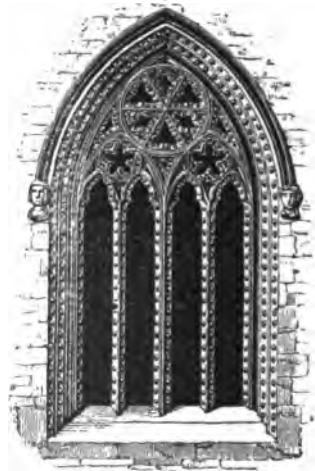


FIG. 84.

Generally speaking, the **Early English** period is characterized architecturally by long, narrow, lancet-shaped

windows arranged in groups of two or three, as shown in Fig. 82, the space between the openings usually containing a third perforation in the form of a trefoil or quaterfoil included under the same dripstone as the window opening. The mullions, or bars, separating the window openings were, toward the latter part of this period, split to form a network in the upper part of the window, called *tracery*, as shown in Fig. 83. This tracery was greatly elaborated as the style advanced, and filled the upper portion of the window with a complicated series of geometrical forms that were frequently richly elaborated with a *ball-flower ornament*, as shown in Fig. 84.

132. The Ball-Flower Ornament.—The ball-flower ornament is characteristic of the *Decorated* period, and



FIG. 85.

consists of conventionalized floral forms nearly spherical in shape, a detail of which is shown in Fig. 85. They were not always used to such an excess as is shown in Fig. 84, and were inserted under the dripstone at regular intervals, as shown in Fig. 86, which is a *sedile*, or seat, sometimes built in the interior walls of a church. The dripstones of this period usually terminated at each end in the carved head of some person of prominence, such as the king or bishop, as shown in Fig. 84.



FIG. 86.

As we approach the *Perpendicular* period, the lines of

tracery are still more complicated but arranged more in perpendicular panels, the horizontal elements being suppressed as much as possible.

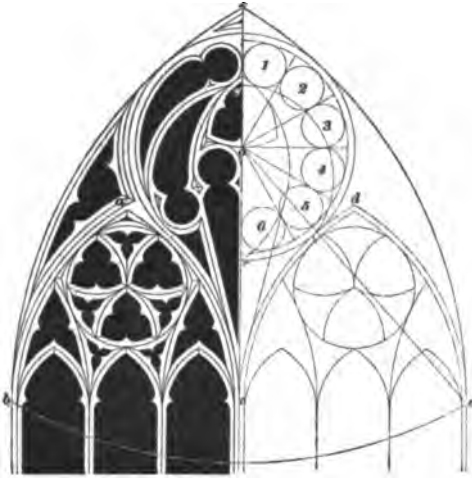


FIG. 87.

133. Designs for Window Heads.—All these designs for window heads were worked out on simple geometrical combinations, as shown in Fig. 87, which is a window with six days, or openings,

divided in two groups of three each by means of pointed



FIG. 88.

arches shown at $b a c$ and $c d e$, over which a circle is struck, with its center at o , whose diameter is equal to half the width of the window, and its circumference is divided into twelve parts, as shown at $1, 2, 3, 4$, etc. Within each of these parts, small circles, tangent to one another and to the circumference of the great circle, are described, and form the generating elements of the interior design.



FIG. 89.

This example is given with its construction lines simply to show how these details are geometrically worked out. All the elements of the design can be located and executed by means of a pair of compasses and a straightedge, without any other device to lay off measurements.

The lower part of these windows on the exterior, during the Perpendicular period, as said before, were divided into

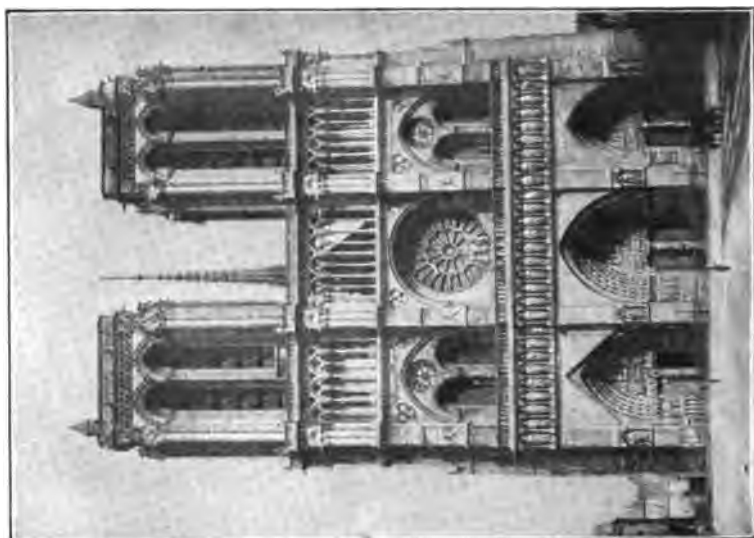


FIG. 91.

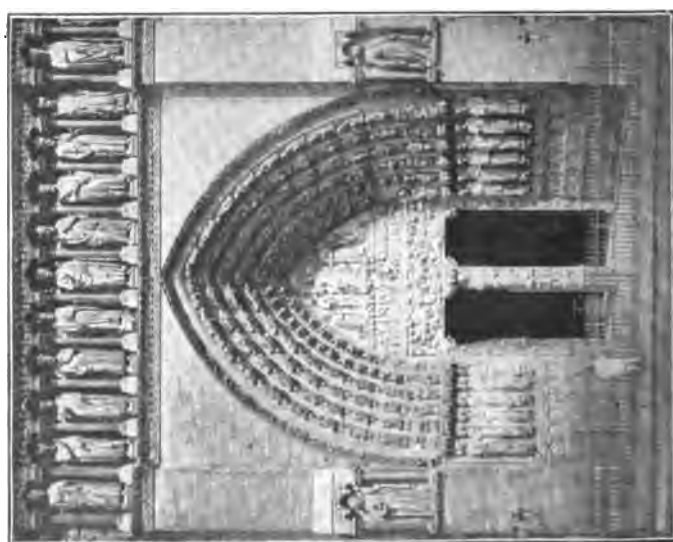


FIG. 90.

long panels, the total window opening usually being of immense area, as shown in Fig. 88, which is the west front of St. George's Chapel, at Windsor. This also shows the general exterior appearance of the Gothic architecture of Great Britain, and, with the west front of Westminster Abbey, shown in Fig. 89, will be interesting to compare



FIG. 92.

with the Gothic art of other countries, which we will consider hereafter.

134. French Window Tracery.—In France, the progress of window tracery was similar to that of England, but on less systematic lines, and the doors and windows tend more to rich elaboration on the exterior, usually being carved with full-length human figures, as shown in Fig. 90, which is one of the entrance doors to the church of Notre Dame, Paris, the full front elevation of which is shown in Fig. 91. A comparison of Fig. 91

with the two examples of English Gothic will be interesting, showing the tendency of the latter to vertical lines more characteristic of the Gothic style, and of the French to horizontal lines influenced by its closer proximity to classic art.

135. Gothic Architecture in Italy.—In Italy, Gothic architecture is unique, and though the Palazzo Vecchio,



FIG. 93.

at Florence, shown in Fig. 92, possesses the crude, bold, unassuming construction of the early Gothic castles, it scarcely represents the fundamental principle on which the Italian design is developed. It is in Venice that we find more elaborate examples, where window tracery is carried to a most fanciful extreme.

The Foscari Palace, shown in Fig. 93, shows the gradual

development of this window treatment, which seems to constitute the entire idea of the Italian-Gothic style. In the

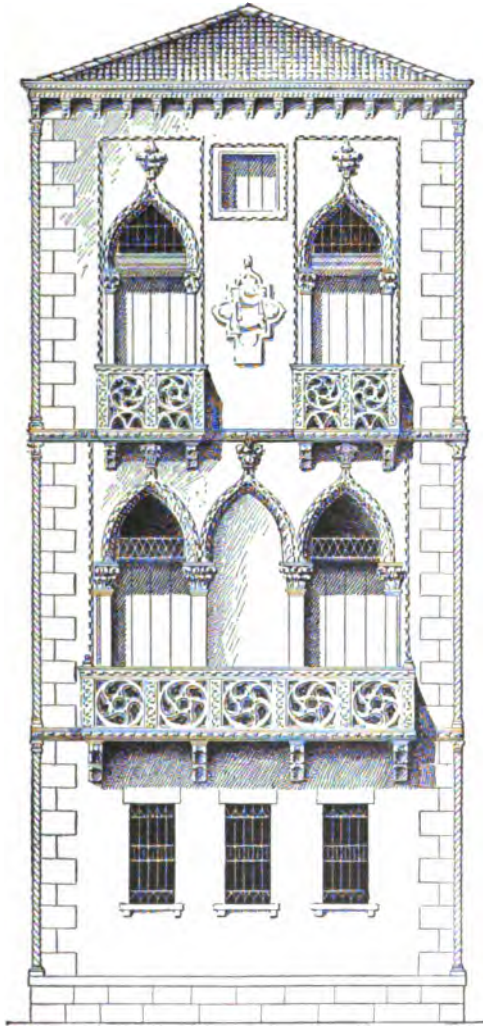


FIG. 94.

lower story we have the plain ogival arch, and in the central portions of the second and third stories, small colonnades,

connected by pointed arches, and in the upper of the two with pointed arches, separated by plate tracery. In the top story, this tracery is carried to an elaborate extreme. This system of treatment, though based on entirely different structural ideas from the Gothic of the North, brought about many happy results, however, and the palace of Contarini Fasan, also known as the House of Desdemona, shown in Fig. 94, exhibits how adaptable the style of this Venetian work is to modern requirements by the careful proportioning and grouping of its parts and treatment of its details.

It is not in the exterior of these buildings that we find the most of value to us in ornamental design, except possibly in Venetian work; therefore, the treatment of the interior details we will now consider in regular order, having understood the transition in style that took place from the British Isles to the Italian peninsula.

136. Evolution of Gothic Ornament.—The transition of the round arch, characteristic of the Romanesque style, to the pointed arch, characteristic of the Gothic style, is easily traced in buildings where the two styles are intermingled, many of these being extant about the beginning of the thirteenth century, as shown in Fig. 95, which is taken from an arcade of Canterbury Cathedral, in England. But the passage from Romanesque ornament to that of the Gothic period is by no means so easily traced.

All traces of the acanthus leaf have by this time disappeared, and we find a purely conventional style of ornament prevalent in all buildings of the time. The nearest approach to the acanthus formation we find in the illuminated manuscripts of the twelfth century, where ornamental forms, such as shown in Fig. 96, are used, and appear to have been derived from some old Greek manuscripts, as Gothic ornaments are formed by a continuous stem throwing off leaves on the outer side and terminating in a flower.

Early English ornament is the most perfect, both in principle and in execution, of all the Gothic period. There is as

much elegance in distinct modulations of form as there is in the ornament of the Greeks. It is always in harmony with the structural features of the building, and always grows



FIG. 95.

naturally from them. It fulfils every one of the conditions that we desire to find in a perfect style of art, but it remained perfect only so long as the style remained conventional. As the style became less idealized and more direct in imitation, it ceased to be an ornament of structural features, but became ornament applied.

137. Characteristics. —

In the capitals of the columns of Early English architecture, the ornament rises directly from the shaft, above the necking of which the column splits



FIG. 96.

into a series of stems, each stem terminating in a flower, as shown in Fig. 97. This is analogous to the mode of decorating the Egyptian capital. In the decorated style, on the contrary, where a much nearer approach to nature was attempted, it was no longer possible to treat a natural leaf as



FIG. 97.

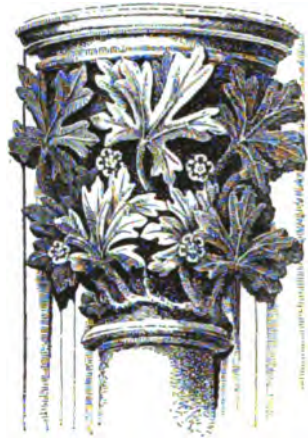


FIG. 98.

part of the shaft, and therefore the shaft is terminated by a bell shape, around which the leaves are twined, and the more natural these were made, the less artistic became the arrangement, as shown in Fig. 98. This method of applying ornament reminds us of the Roman-Corinthian capital.



FIG. 99.



FIG. 100.

In the Perpendicular period, the capitals of the columns were usually plain, and the shaft consisted of a cluster of

small columns. In some large buildings, however, the capitals were carved with shallow foliage of a pronounced geometrical shape, as shown in Fig. 99.

In foliage and running ornaments on bands and moldings, the Early English period shows examples where the lines of the ornament follow the general directions of the lines of the molding, and the foliated work is conventionally rendered, but, at the same time, is graceful and natural, as shown in Fig. 100. In painted bands, the lines usually are easy and flowing, following the principle of carved work, as shown in Fig. 101.



FIG. 101.

During the Decorated period, however, there is less effort made to continue the foliage in the direction of the molding, and the guiding stem frequently wanders directly across the molding, from one side to the other, preserving the governing principle of throwing leaves off alternately, but at the same time chopping the molding up into a number of sections rather than giving it a feeling of continuity.



FIG. 102.

In Fig. 102 is shown an example of molding from this period, where the guiding stem of the foliation crosses and recrosses the molding almost at right angles to the line of its direction, and though the leaves are arranged to cover up this guiding

stem to a certain extent, the fact still remains that its most prominent sections are seen across the molding, instead of flowing with it.

138. In the Perpendicular period, the system of decoration is still further removed from that of the Early English,



FIG. 103.

and the molding is frequently divided up into a number of rectangular panels, each of which is decorated to represent some specific natural form, but so conventionalized as to be reduced

to a pronounced geometrical outline. This is shown in Fig. 103, where the leaves of the grape vine are reduced to



FIG. 104.

perfect rectangles, spaced evenly along the molding, between which bunches of grapes are geometrically arranged.

139. Spandrels.—In the **spandrels** of the arches, so long as the conventionalism of the Early English style was maintained, one main stem was distributed over the panel, from which sprang leaves and flowers, as shown in Fig. 104; but as the style advanced the stem ceased to be the guiding



FIG. 105.

form of the ornament, and, in the endeavor to represent in stone the softness of nature, lost all its grace and decorative characteristics. Finally, the stem as a leading feature disappears, and we find the spandrels filled with three immense leaves, springing from a twisted stem in the center, and bearing no structural relation to the panel on which they are planted, as shown in Fig. 105.



FIG. 106.

140. Diapers. — In the painted wall decorations and diapers, the Early English artists usually divided the surface into a number of geometrical forms within which a simple conventional ornament was introduced resembling tile work. The devices covering these ornaments were sometimes heraldic and other times based on forms borrowed from the vegetable world, as may be seen in Fig. 106.

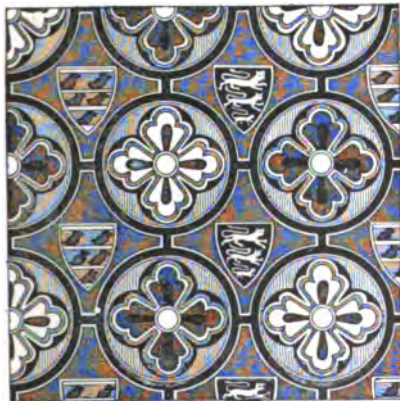


FIG. 107.

Fig. 107. Another system prevalent in the Decorated period was to divide the wall into a number of bands, each of which

During the Decorated period, the wall divisions are less naturally divided, and circular disks, within which are stenciled geometrical patterns, are spread over a wall surface, and between them are arranged shields with coats of arms and other devices, as shown in

was decorated with a running ornament, as shown in Fig. 108, where the character of this running ornament is not widely different from that seen in the Early English period, as shown in Fig. 101. However, introduced with this foliation are forms from the animal world that seem to possess no relation to the design, or the ornament, or the position that they occupy.



FIG. 108.

The diapers of the Perpendicular period are attempts at realism, and in Fig. 109 is shown a painted wall in which the pointed arch of

ogival form and the foliations and crockets characteristic of the carved work of this period are attempted in the reproduction on the flat surface. This form of arch, with its compound curve—convex below and concave above—is a distinguishing characteristic of the Perpendicular period, as is also the subdivision of its under surface into the small arches or foliations, as shown. Within each of these panels (which in all work were long and narrow, giving the style its name of Perpendicular), the wall was decorated in the conventional pattern as shown, and executed in two colors. Similar patterns were also used for silks, tapestries, and other fabrics of this period.



FIG. 109.

In Fig. 110 is shown another style of wall treatment of the Perpendicular period, where the surface remains flat and no attempt is made to depict arches or moldings borrowed from carved ornament, but details from the vegetable world are drawn realistically against a background interspersed with conventionalized outlines of leaf forms.



FIG. 110.

141. Zenith of Architectural Development.—In the thirteenth century, beyond all others, architecture was at its zenith. The mosques of Cairo, the Alhambra in Spain, Westminster Abbey, and the Salisbury and Lincoln cathedrals, in

England, all possess the same secret of producing the broadest general effect combined with the most elaborate decoration. In all these buildings there is a family likeness; although the forms differ and the forces that have called them into existence are totally unlike, yet the principles that they embrace are the same. They all exhibit the same care for the leading masses of composition, the same appreciation of the undulations of form, the same correct observation of natural principles in the ornamentation, and the same elegance and refinement in all the decoration.

The attempt to produce at the present day a building of the character of those in the thirteenth century would be vain indeed. Whitewashed walls with stained glass and encaustic tiles cannot alone sustain the effect that was arrived at when every molding had its color best adapted to develop its form, when from the floor to the roof not an inch of space but that had its elaborate and appropriate ornament—an

effect that must have been glorious beyond conception. In fact, so glorious a point, indeed, had the style reached that it exhausted itself by the effort; the light burned out. Not only in architecture, but in all decorative arts that accompanied it, immediately there began a decline—a decline that never stopped until the Gothic style was dead.

142. Gothic Art in France.—In France, the three periods of Gothic art are known by the terms: (1) *Early French*, corresponding in period with the Early English, but beginning a trifle later; (2) *Rayonnant*, meaning radiating, and corresponding with the Decorated period of English art; and (3) *Flamboyant*, meaning flame-like, and corresponding with the Perpendicular period of English art.

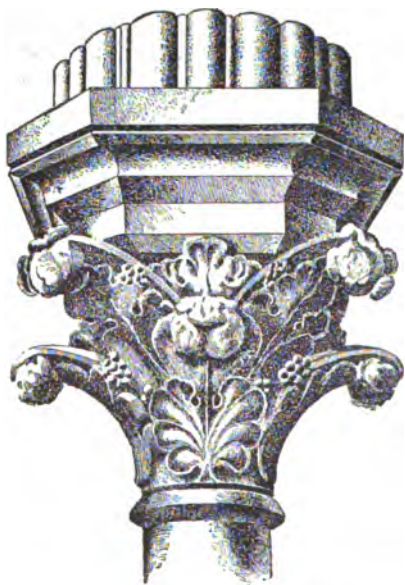


FIG. 111.

143. Early French Period.—The Early French capital, though patterned after the Early English style, does not possess its most important characteristic—that of the apparent springing of the foliation from stems bound together at the neck of a column by a carved band. The capital in Fig. 111 possesses the characteristic of having its foliation spring from the top of the column and spread

out gracefully under the abacus that receives the weight from above, but this foliation seems to be planted on a surface, rather than to be forming a part and detail of the supporting member itself.

144. Rayonnant Period.—In the **Rayonnant period**, the capitals of the columns, like those of the Decorated period in England, are formed of bell shapes over which foliage is arranged; but, as shown in Fig. 112, the French arrangement is far inferior to the English, inasmuch as no attempt is here made to have the foliage a part of the supporting construction. It is evident that the bell shape does the support-

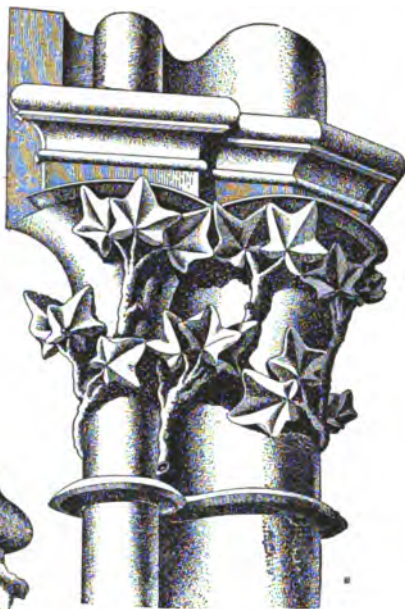


FIG. 112.



FIG. 113.

ing of the superimposed load, and the carved vine is simply an ornament laid on the surface to break up its monotony.

145. Flamboyant Period.—The **Flamboyant style**, shown in Fig. 113, carries this fault to still greater extent, and the twisted foliation is plainly planted on the bell shape,

growing from nothing, supporting nothing, and apparently ready to drop off, as there is no reason why it should be left

there. In Fig. 112 the vine is of a clinging character and would naturally appear to attach itself to the capital, although it does not appear to grow naturally out of the shaft of the column in the manner characteristic of the foliage of the Early English capitals. In Fig. 113 the foliation is not only of no particular character, but it is simply



FIG. 114.



FIG. 115.

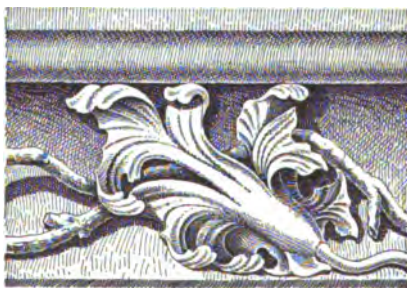


FIG. 116.

“stuck on” with no origin and no structural relation and conveys no idea of fitness or propriety.

In the running bands and moldings we find the same characteristics as those of England, but not so pure in form. In Fig. 114 the foliated forms, it will be observed, appear to be attached to and grow from the top and bottom members of the molding. The line of their growth is curved toward the center of the molding, but, at the same time, follows the line of the molding itself and appears continuous with it; while in the Rayonnant period, as shown in Fig. 115, the molding is divided up in sections more like the Perpendicular period of

England, and the leaves, though growing apparently from the stonework beneath them, are nevertheless stiff and

geometrical and do not appear to belong to the surface on which they are placed.

A characteristic of the Flamboyant style is seen in Fig. 116, where the guiding stem of the ornament that is carved on the molding is in some places clear from the molding itself, and though it shows great skill in the carving, exhibits little art in the design. The leaves and floral forms are twisted so that their ends represent forked flames, from which the period gets its name, and there is no structural relation between the foliation and its moldings.



FIG. 117.

146. Early French diapers divide the wall surface into geometrical forms in a manner similar to that in England, and stenciled within these figures are characteristic devices typical of the nation and the style.



FIG. 118.

In Fig. 117 we have a wall divided into lozenge shapes by diagonal lines, within some of which *fleurs-de-lis* are stenciled in gilt on a blue ground, while a simple foliated outline is stenciled within the others on a gold ground.

In Fig. 118 is shown a more complicated design based on the intersection of a number of circles whose centers

are found at the intersections of evenly spaced vertical and horizontal lines. In this case, the ground of the decoration is pink, and the outlines of the subdivision and the stenciled forms within them are in gold.

147. The character of surface treatment in the Rayonnant period is best shown in Fig. 119, which is from an illuminated manuscript. The lines of the foliage and the



FIG. 119.



FIG. 120.

geometrical rendering of the flowers are characteristic of this style of work, and the twisted forms are suggestive of the change that is taking place toward the Flamboyant period. In Fig. 120 is shown another example from illuminated manuscript, where the naturalistic treatment of the flower, with the foliage reduced to a flame-like outline, shows the systematic rendering of all work of this period.



FIG. 121.

148. German-Gothic Details.—**German-Gothic details** were influenced more largely by France, but, at the same time, borrowed ideas direct from England. Fig. 121 shows a wall diaper divided into circles somewhat after the manner of the English example shown in Fig. 107, within which geometrical forms are stenciled in some cases, while in others the conventional brush form of the eagle, emblematic of Germany, is rendered in light green on a darker ground of the same color.

149. Misinterpretation of Gothic.—As the term “Gothic” as applied to architecture is, in the minds of most persons, associated almost entirely with ecclesiastical edifices, we are all likely to labor under the impression that the medieval cathedrals were the only structures built during these dark ages. As a matter of fact, however, every building erected during the thirteenth and fourteenth centuries, throughout Western Europe, was built in what we now call the Gothic style. In order that we may better understand this domestic architecture and its details, from which much of our ornament at the present day has descended, it will be necessary for us to look into the habits, customs, methods of living, and government of the people at this period.

Kings, princes, earls, and even the lesser nobility, all lived in castles during this period, and these structures form a most important part of the architecture, as they are undoubtedly the prototype of the modern dwelling house from which have descended all those details of house plan that modern requirements have brought into service.

150. Feudal System.—At this time all lands were held under what is known as the **feudal system**. When the tribes from the North had conquered Rome and overrun the entire Roman Empire, the generals or chiefs of the different military organizations were given lands for themselves and their subjects over which they ruled as kings and princes. This system existed throughout all Europe, but with slightly varying conditions in Italy, France, Germany, and England,

according to the influences of each locality. The general principle was the same, however, and we will confine our discussion simply to the effect of this system in France, inasmuch as it reached a most thorough organization there, and had a more marked influence on the subsequent art of the period of the Renaissance.

The political organization of a country under the feudal system consisted in the bulk of the land being divided into states called *fiefs*, which were held by their owners on the condition that they should, when called on, perform certain military duties to their superiors or pay them fees in grain, wines, cattle, etc., and in default of such service or payment, the land could be reclaimed. The superior lord might be the king of the realm, or some nobleman that held a feudal tenure from the king, and who in turn created fiefs by and under his own personal rule.

An important detail of the old feudal law was the fact that the king or superior lord, from whence comes the modern term landlord, was entitled to the fealty of his own tenants, but not to that of his subordinate tenants, every man looking for rule and discipline only to his own immediate lord and master. It therefore frequently happened that one of these noblemen would build up a community so powerful as to feel practically independent of his king, and therefore refuse to render to his superior such military service as was demanded. The result of this was inevitably the same—war between the king and his subject. On the other hand, if the subject remained loyal to his king, he was likely to depend on the royal influence and encroach somewhat upon the fief of some one of his feudal neighbors. This would bring about the same result—war between two feudal barons. And even if he remained within his own territory and was true to his sovereign, the prosperity of his fief or his influence with the royal court was sure to excite the jealousy of some one of the surrounding nobles and bring about war.

It would thus appear that the feudal barons were at war with one another a large part of the time, and these frequent

wars required that the medieval castle should be a military post from necessity and a domestic household for convenience. During the war the castle was the stronghold of the lord and his retainers, and during peace it was a house of entertainment for his guests and vassals.

151. Castle of Coucy.—In Fig. 122 is shown a plan of the castle of Coucy, near Laon, France, the irregular outline of which is due to the fact that military engineering required that these structures should conform as nearly as possible to the top of the hill, on which they were usually built, thereby rendering it impracticable to storm the fortress from more than one side—that on which the entrance was located.

A large tower, or keep—in the French castles called the **donjon**—guarded this main entrance and at the same time served as a stronghold and point of last resort in case other portions of the castle should fall into the hands of invaders. The donjon of Coucy was 180 feet in height and 108 feet in diameter, and the walls were 34 feet thick at the

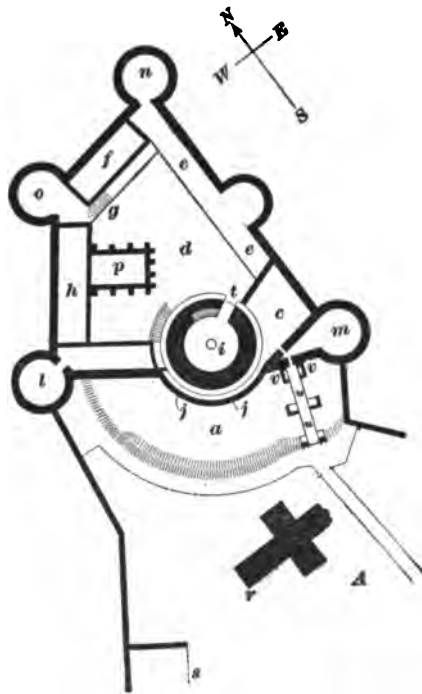


FIG. 122.

base. The uppermost of its three stories was the largest, as the walls were thinner at the top, and 1,500 men could be here assembled in a circular room and receive their instructions for the military routine of the day. In the middle story was the family apartment for use during siege, and in

the basement were storerooms for sufficient provisions to last 1,000 men over a year.

The keep was surrounded on the outside by a moat, or water-filled ditch, shown at *a*, beyond which was a large enclosure shown at *A*, called the outer bailey. This was a large piece of cultivated land and contained the chapel *r* and the stables *s*. The interior courtyard *d* was called the inner bailey and was the only outdoor area open to the garrison in time of siege.

These points are of interest, as from them are developed many details that are characteristic of the modern house in plan, while other details of more decorative value had their origin in devices originally invented for purely military purposes.

152. In Fig. 123 is shown a bird's-eye view of the castle of Coucy and the surrounding country. Around the top of each of its five towers will be observed small projections that carry an enclosed gallery. The spaces between these projections, or *corbels*, as they were called, were open through the floor of this overhanging gallery, and, in time of siege, when the walls of the castle were surrounded by sappers and miners endeavoring to disintegrate the stonework and gain access to the interior, deadly missiles were shot straight down from the floor of the gallery, or quantities of boiling oil or molten lead were used to make the base of the walls as unapproachable as possible.

The windows in the castle all opened on the inner bailey, no openings being permitted toward the outside except small loopholes of sufficient size only to shoot an arrow through. The tops of the individual walls enclosing the inner bailey were notched, and the rectangular sections of wall between the notches—called battlements—each contained a large loophole, as may be seen in the perspective view at *j*. Behind these battlements was a platform on which archers could stand and shoot at an invading force, while a similar treatment of the top of the walls around the outer bailey enabled the besieged to defend the outer bailey

against the besiegers before finally retiring within the castle walls for safety.

All these details were altered from time to time, as civilization advanced, and when the invention of gunpowder

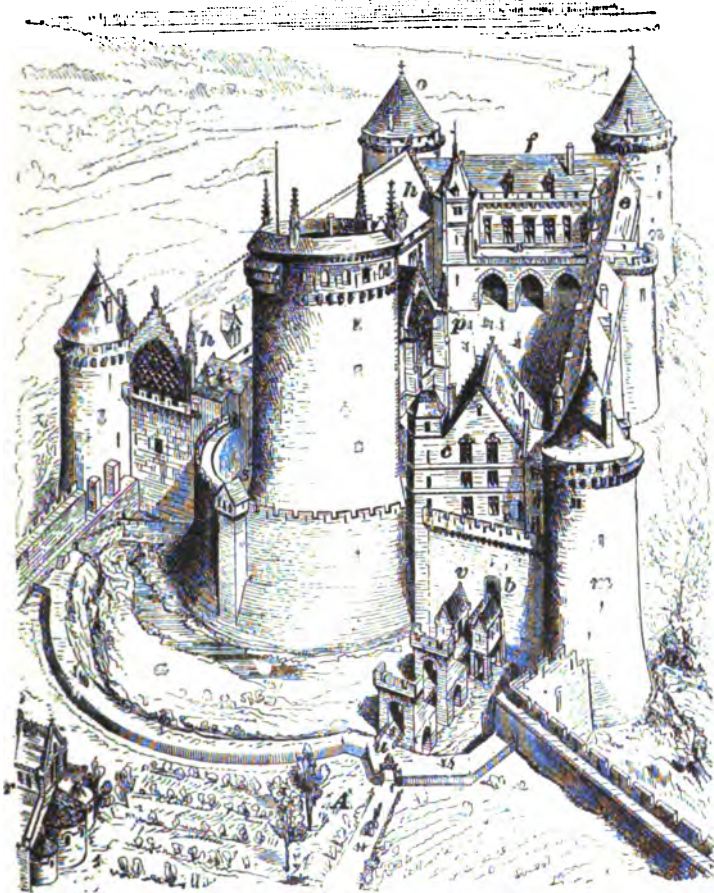


FIG. 123.

rendered the castellar system of defense obsolete, the corbels, battlements, and other details of feudal military origin were still retained as ornamental features in many of the buildings developed from the castellar plan.

153. Mode of Living in Ancient Castles.—Regarding domestic life within these castle walls, it is well to remember that, previous to the fourteenth century, there was not much subdivision in the household apartments even of royalty, the king and queen and the servants and retainers all usually occupying one room, known as the great hall. This great hall is shown in the plan at *h*, and was to the domestic part of the household what the donjon was to the military—the main apartment wherein all household duties were performed. Here the lord sat at his meals with his family, his guests, and his retainers; here he transacted all business of the day, both financial and domestic; and here in the earliest times he slept at night on a rough couch at one end.

By degrees, society began to improve and become more refined, and the constant daily association with servants and soldiers becoming undesirable, the great hall was divided into two apartments, one of which was known as the *withdrawing room*, where the lord and his family could retire after meals, but the hall was still retained for business and dining purposes. However, a further subdivision provided another room for the transaction of business, which was still called the *hall*, but in distinction the remaining portion was called the *dining hall*. These three rooms—the hall, the dining hall, and the withdrawing room—were the principal apartments in the house or castle, and, consequently, the separate sleeping apartments, which advanced ideas demanded, were crowded into any out-of-the-way corner that circumstances afforded. For this reason, these sleeping rooms were often dark, cheerless apartments, and were designated by the term *chamber*—a word derived from the Latin, meaning a dark vault—and finally, when the bedstead was introduced as an article of household furniture, the sleeping rooms were called *bed chambers*, to designate them from other rooms in the castle of similar character but not for sleeping purposes.

154. Heating of Ancient Castles.—In the earliest days, the castle was heated by an immense fire-grate located

in the center of the room, the smoke from which passed through openings in the roof called *louvre*s. Subsequently, this grate was removed from the center to the side wall, and the louver was replaced by a chimney-stack. This necessitated a separate chimney for each room, and is responsible for the fact that nearly every French château built in the fifteenth and sixteenth centuries bristles with beautifully designed chimney stacks above the roof, and nearly every room in the French château of the Renaissance period possesses a fireplace and a distinctively designed mantel.

155. Heraldry.—Another point of this feudal system is the subject of **heraldry**, which is of vast importance in its relation to historic ornament, inasmuch as it is based entirely on that important characteristic of all ornament, namely, *symbolism*. It is doubtless true that armorial bearings were not in much general use until the twelfth century, when they were brought into prominence by the crusades—a term given to those wars waged by the Christians of Western Europe against the Mohammedans around Jerusalem for the purpose of rescuing the Holy Sepulcher from the hands of infidels.

The purpose of heraldic devices was to designate one person from another, as surnames did not exist in those days; and though the painted device by which the savage sets forth his personality may be considered as heraldic as the device borne on the shield of a soldier, it is with the latter class that we have to do in ornamental design.

We have seen in Egyptian art evidences of heraldry, inasmuch as the two serpents flanking the sun disk of the winged globe are symbols of Upper and Lower Egypt, and, therefore, heraldic. But with the twelfth century, we arrive at a system of heraldry whereby the heraldic device was passed down from generation to generation, in the same manner that the family name is transmitted at the present day. A heraldic device would be transmitted from father to son, on the death of the former, with few alterations, so that in our study of the history of subsequent styles, we can

locate and date many details by our familiarity with the insignia associated with certain royal families.

156. The Fleur-de-lis.—The *fleur-de-lis* has ever been emblematic of France, because Hugh Capet, the first French king, carried it on his shield as the insignia of his family, and subsequent rulers used this same emblem as an indication of royalty, while they coupled with it some other device to more clearly establish their own personality. In subsequent periods, as we shall see, the initial letter was frequently used by royalty on works of art erected by them during the period of their reign; but this is not of so much importance to us as the heraldic devices, as several sovereigns of the same name ruled many years apart. The importance of these heraldic devices cannot be overestimated, as will be pointed out when we study the ornament of the subsequent periods in the *Renaissance*.

HISTORIC ORNAMENT.

(PART 8.)

RENAISSANCE ART.

INTRODUCTION.

1. Origin.—Although the medieval style of art and architecture prevailed throughout all Europe for at least six centuries, it is still a difficult matter to draw a line at certain dates when the influence of the ancient classic art utterly ceased and the revival of that classic art after the Medieval period took place. In fact, if the two subjects were studied separately and independently, it is not unlikely that traces of revival of classic art could be discovered even before the classic style itself had become extinct.

It must be borne in mind that Italy, in the extreme southern part of Europe, was the seat of the original Roman government, and the country wherein the classic style developed to its greatest voluptuousness. The Roman people spread all over civilized Europe and established their monuments everywhere, but no place so profusely as in Italy itself.

After the conquest of Rome by the barbarous hordes from the North, the Latin-speaking people were largely confined to the Italian peninsula, and though a new style of architecture was developed by the conquering race—a style since derisively termed Gothic by the artists of the Renaissance

period—the original Romans at home still endeavored to adhere to their ancient traditions and styles of art. If this point is thoroughly understood, there will be no difficulty in tracing the progress of Renaissance art from Italy throughout Europe. We have seen that the farther north we go from the site of the Roman Empire, the purer was the style of the Gothic art that prevailed, inasmuch as it was less hampered by the tradition of classic art.

2. Revival of Classic Style.—Now, when it comes to a revival of the classic style, it is not strange that that revival should take place first in Italy, where the Gothic style never secured a prominent foothold, that the revival should spread from Italy to France—a people made up largely of Latin extraction—and that, lastly, it should extend from France to England, but in a very imperfect form, as the English people were not Latins and had no sympathy with, nor tie to, the original Latin style. Bear in mind also that the Celtic ornament, of which we have studied, originated among the earlier inhabitants of the British Isles and naturally influenced any importation from a strictly foreign country, as was Italy.

3. Scope of Renaissance Period.—In describing Renaissance art, we will commence at the period of its infancy and continue under this heading down to the present day, inasmuch as there has been no new style evolved and no revival of any other style that need break this term of continuity. Moreover, it will not be inadvisable for us to set a period or character of the Renaissance style that theoretically may be considered the best, and, in doing this, we must consider all the influences that are brought to bear.

4. Intention of Renaissance Artists.—The effort of the Renaissance artists was not to invent a new style, nor to bring about through a transition a development based on classic lines, but to deliberately copy the monuments of pagan Rome and Greece and use these heathen forms, no matter how inappropriate or illy suited for the purpose of

modern Christian art. They were different from anything they had ever seen or conceived; they were the products of an age of wonderful art and literary advancement, and, in the eyes of the Renaissance artists, were accepted as superior to anything they could themselves devise.

5. Renaissance Art in Italy.—The style of Renaissance we find in Italy, where Gothic art had its slightest influence, naturally adheres as closely as possible to the old Roman forms, for there they had the old Roman buildings, many of them still intact, that could be copied line for line.

The invasion of Italy by Charles VIII of France, toward the close of the fifteenth century, brought into the latter country examples of this revived Italian art that were much admired by the French public, and the revival of classic art was immediately felt throughout France. Devoid of actual buildings from which they could study their designs, the French artists were compelled to go to Italy and study, and French kings imported Italian artists to do work in and around Paris. Either experiment was bound to produce an altered style.

6. Introduction Into France.—The French artist had been working in the Gothic style, and he studied the Italian monuments with an idea of medieval construction in his mind. The Italian artist came to France possibly with a clearer idea of classic art, but was hampered in his execution by the necessity of employing workmen that had cut stone in no other style than that which had prevailed during the six centuries of the Middle Ages. An even compromise can therefore be considered to have taken place between the perfect construction of the Gothic style and the perfect proportion of the classic art.

7. Introduction Into England.—The introduction of Renaissance into England, however, was far different. True, her artists studied the styles under great Italian masters at Rome, but they, too, had to compete with designers in the local school, where Gothic art had secured its strongest

foothold. Germany and Holland before this had adopted the Renaissance style from France, and the systematic patience of the Germans and the phlegmatic immobility of the Hollander are well woven into the style of classic art they reproduced. When these perverted ideas were transmitted to England, it is easily understood that they contained few details that could be considered purely classic. By a successive alteration through several countries, they could be with difficulty identified with their original type.

8. Purity of French Style.—We may therefore consider that in France we find the best examples of a practical adaptation of the ancient classic ornament to modern conditions and purposes, while in Italy we find a Renaissance of classic art that adheres more closely to the classic style, but can hardly be considered even a new departure. In England, however, the style that was developed in the Renaissance period is not classic at all, except in its derivation, and there, after repeated endeavors to apply the inappropriate forms to the modern purposes, the style was abandoned and an endeavor made to revive that of the Medieval period.

ITALIAN RENAISSANCE.

9. Origin.—Fragments of exquisite beauty in stone, bronze, and marble were hardly covered over by the top of the soil in the ruins of the ancient buildings of Rome, and these buildings therefore became quarries from which stone was easily obtained and recut to be used for tombs and other buildings wherein the style of art for which they were originally used played no part. This accounts largely for the fact that Gothic art secured so little foothold in Italy and remained for so short a time.

The pointed arch was introduced in the northern part of Italy early in the thirteenth century, and this might be considered the planting of the seed of Gothic art in this territory; but almost at the same time there was a protest

made in favor of the ancients and the arts as being superior to anything the barbarous hordes from the North could produce.

10. Art and Literature.—The great poet Dante, though an ardent Christian, was a profound student of classic learning as well as a strong advocate of pagan art. The celebrated authors Petrarch and Boccaccio were intimate friends and spent their lives, not, as many people supposed, in writing Italian poetry and prose, but in laboring almost incessantly in the preservation and restoration to the rest of the world of the long-lost text of the Roman and Greek authors. It was Boccaccio that first gave to Italy a lucid account of Greek mythology and that first instituted a school for the study of the Greek language at Florence, and these efforts at a revival of learning were seconded and backed by a large number of notables who could not have failed to make it a success.

11. Invention of Printing and Its Effects.—Now, understand that at the time when the labors of all these men had accumulated in their libraries—public and private—all that could be recovered of classic learning, all that could be gathered from the earliest scrolls of the Greeks, all the information concerning art that remained from the wreckage of old Rome, about the middle of the fifteenth century, the art of printing was introduced into Italy and the learning of the ancients became spread among the people of all Europe.

The invention of printing and the printing press is therefore responsible for the development of the Renaissance style. Louis XI of France sent Nicholas Jenson into Italy to learn, "the new art by which books were made." This learned man was no less a competent editor than he was a zealous printer, and from about the year 1490 he gave to the world in rapid succession many editions of Greek and Latin classics and a history of ancient art profusely illustrated with engravings on wood.

12. Publication of Vitruvius.—Through these illustrations, which display a study on the part of the artist of ancient art, types of ornament geometrically opposed to those of the Middle Ages were disseminated over the continent of Europe; and, in 1511, the publication of the architecture of Vitruvius at Venice, with illustrations of the classic orders of architecture, set a final seal upon the fate of matters in art and afforded the means of spreading throughout other countries those details of ancient design that had so engaged the art public of Italy.

13. Italian Aversion to Gothic Forms.—However, before those laborers that were endeavoring to bring classic art and literature to the front had succeeded in getting the least sign of encouragement, it was apparent that the Italians did not take kindly to Gothic forms. The acanthus leaf was typical of Italian art, and the foliated capitals of the Gothic school had to accept this form of vegetation.

In its earliest stage, Renaissance art in Italy was really a revival of classic principles, and it was not until the middle of the fifteenth century that it could be considered an actual revival of style.

14. Roman Influences.—At Rome the great wealth of the Italian princes and the great ecclesiastical works undertaken by successive pontiffs of the Church attracted to that city the highest procurable ability in the art world, and it is for that reason that we can still find in Rome, in the various palaces and churches, the most exquisite fragments of decorative sculpture in detail.

15. Donatello.—One of the most interesting qualities of this style of ornament is the skill with which those by whom it has been wrought have availed themselves of a variation of light and shade by the treatment of the surfaces on which the ornament is raised. The refined appreciation of the delicate shades of relief in sculptured ornament was carried out with the greatest perfection by Donatello, an artist whose authority on matters of art was held in the

highest esteem by the people of Florence, and whose example was followed by all classes of artists.

He was the first to practice the true *basso rilievo*, by which the effect of projection and of rounded molding is obtained within what would appear to be impracticable limits of relief; that is to say, in modeling his ornament on surface, it was raised but slightly above the surface but was treated in its carving so as to appear in high relief.

Donatello then combined this style of work with *mezzo rilievo* and *alto rilievo*, the former being a half relief, and the latter being a sunken ornament below the surface on which it was executed. This combination maintained a division of the subject of his design into several planes. Donatello enriched many of his ornaments with elements derived from the art of painting.

16. Plane System.—At the zenith of its perfection, this system of regular arrangement of ornament in planes was so ingeniously managed in position of light and shade that, when viewed from a distance, the relief presented only certain points symmetrically disposed with some dominating geometrical figure. An approach of a few yards served to bring to the eye lines and details connecting the points of greatest importance, and a still nearer approach revealed the leafage of the delicate tendrils that were required to convey a tangible idea of the type of nature selected for the conventionalized design. And beyond this, no inspection could be too close a test of the artist's perfect appreciation of the refinements of surface texture.

17. Characteristics.—In the hands of less profoundly impressed artists than Donatello—those possessing an inferior sense of the proper limit of convention in sculpture—the introduction of pictorial elements in the bas-relief design soon degenerated into realism and confusion. Great as was the skill of Ghiberti, the effect of many of his most graceful compositions was marred by the introduction of perspective

effect and accessories too servilely copied from nature. In many of the ornaments of sculpture, this fault is exaggerated until the dignity of the design is lost in the frivolity of the detail. These monuments, decked with huge garlands of flowers, hung with heavy cartouches and tablets, and fancifully overgrown with foliage, appeared more as examples of the artisan's skill than works of art commemorative of the date or dedicated to sacred purposes.

This is somewhat illustrated in Fig. 1, which is a part of a cornice taken from the Palazzo Vecchio, or Town Hall, of Florence, Italy. This also illustrates the minutia of detail



FIG. 1.

with which this style of ornament abounded. Along the frieze are heavy garlands of flowers, the design of which includes also fruit and grain, while at the points between which they are stretched are hung shield-shaped cartouches bearing devices of a more symbolic character. The fleur-de-lis, emblematic of certain royal families, and the crossed keys of St. Peter are here seen, and it would appear that one of them must be strangely out of place in the frieze of a town hall. The other ornaments on the moldings, though

elaborately carved, are less out of place and are characteristic of the style and period.

18. Frivolity and Incongruity of Designs.—The panels in the elaborately carved seat in Fig. 2 show to what extreme and frivolity ornament of this character can be car-



FIG 2.

ried. Here, as the settee in St. Peter's Church, Perugia, we have a design not only proportioned according to the pagan rules and ideas, but elaborately interspersed with grotesque

figures, comic masks, griffins, bucrania, flowers, and fruit, not one of which would appear to be particularly identified with any detail of the Christian faith.

Many of the designs of this period are strangely incongruous with the purpose for which they are called into existence. Tragic and comic masks, musical instruments, antique altars, tripods, hybrid marine monsters, and chimeras do not harmonize well with monuments reared in consecrated edifices or dedicated to religious rites. However, this fault of the confusion of details cannot be laid entirely upon the shoulders of the artists of the Renaissance period, as their works may be considered simply as a reflection of the taste and dominant spirit of the age; and this revival of mythological symbolism was a protest against the hampering trammels of esthetic tradition erected into dogmatism by the rulers of the East, and endorsed by the Church during those centuries when its ascendancy over an ignorant and turbulent population was at its greatest height. The minds of even the most religious men were thoroughly imbued with such inappropriate and incongruous associations in the fourteenth century.

19. Value to the Designer.—To the designer, the study of this period in ornament is of the greatest value, as in no style has ornament ever been better spaced or arranged to contrast more agreeably with the direction of the adjacent architectural lines by which it was bound and always kept in subordination. Rarely do we find an ornament placed in a horizontal position that is more suitable to a vertical one, or vice versa; and rarely are the proportions of the ornaments and moldings, or the stiles and rails by which regularity and symmetry are given to the whole, at variance with one another.

20. Propriety of Subject.—In Fig. 3 is shown a column from the inner court of the Palazzo Vecchio, with its stucco decorations in the style of the Renaissance of this period. Observe that the arabesques fit perfectly the rectangular panels on the sides of the octagon column, and

that the ornament is well spaced, appearing not crowded or excessive, but flowing naturally and preserving a proper relation between the plain surfaces and the richly ornamented ones. None of this ornament could be said to have



FIG. 3.

been better suited to a horizontal position, nor can it be stated that the relative proportions of the details of the ornament are such as to make one portion of it any more prominent or excessive than another.

In Fig. 4 is shown another column from the same building, ornamented on an entirely different system, although included in the group with the one of the previous example. Here the flowing grape vine winds spirally around the column, and the leaves and fruit are so disposed as to set off clearly the details and at the same time preserve that space relation that is always characteristic of good ornament.

The capitals of these columns, it will be observed, are almost identical in design, although one of them crowns an octagonal column and the other a round shaft.



FIG. 4.

21. In Fig. 5 is shown one end of a sarcophagus in the tomb of Marsuppini, at Florence, designed by a pupil and follower of Donatello. This is considered one of the finest examples of Italian-Renaissance sculpture. The treatment of the leaves and foliage, and the proportioning of the ornament to the surface, with the dignified simplicity of the inscription and frame, make it deserving of close attention and consideration of the method by which its decoration is handled. The relation here of plain surface and running ornament is very happily proportioned, avoiding

so successfully the appearance of excess, so characteristic of most Renaissance design and at the same time satisfying the mind as to its sufficiency.

22. Scrollwork.—In Fig. 6 is shown the capital of a pilaster from the church of San Spirito, in Florence. The treatment of the acanthus leaf here, it will be observed, is very similar to its treatment on the Roman-Corinthian capital, very few alterations having been made in the type. The introduction of the oak leaf in an acanthusized form shows a step in progression, as does the introduction of the acorn accompanying the leaf. The peculiar form of S scroll in the center of the capital, each side and below the acorns, is characteristic of the Renaissance, and has its origin



FIG. 5.



FIG. 6.

undoubtedly in that irrepressible tendency of Roman ornament to end its scrolls each time in a flower. The proportioning of the ornament to the surface in this case, however, is much more moderate and refined than in the Roman-Corinthian capital, and though copied after the classic model, this is certainly an improvement on it.

23. Foliated Terminations. — In Fig. 7 is shown a portion of a cornice supported on pilasters around the doorway in the same church. The treatment of the frieze shows its origin in Roman ornament, but the introduction of the



FIG. 7.

human figure and birds with foliated terminations reminds us again of the innovations made by the Renaissance artists. Observe that all surface is here ornamented, that every molding is cut to break up an appearance of continuous line and cast an irregular shadow, and that the surfaces, such as the top of the pilaster and its capital and the panels in the frieze just referred to, all have their decorations properly proportioned and in keeping with the position they occupy.

In Fig. 8 is shown another cornice from the same church, the design of which follows more closely the ancient classic model. The ornament on the frieze is carved in high relief and does not possess that easy flowing feeling that is seen in the previous example. The same may be said of the



FIG. 8.

moldings on the pilaster that supports the cornice, and of the capital of this pilaster. The ornament is too thick and there is not sufficient blank surface to rest the eye from this abundance of detail, thereby giving the whole design a feeling of unrest that was more characteristic of the extravagant

Corinthian order of the Romans than the more refined handlings of Italian art.

In Fig. 9 is shown a bracket that forms a detail of the pulpit in the church of St. Croce, in Florence, the treatment of the decoration of which is well worthy of study. The ornament is not excessive and well fills the surface where it is



FIG. 9.

placed, and the leafwork is carved in low relief and does not possess that excessive surface molding that so materially detracts from some of the work of the later Renaissance.

24. Examples of Venetian Renaissance.—In Fig. 10 is a bracket from the Ducal Palace at Venice, and is characteristic of the style of the Venetian Renaissance. The scrollwork and treatment of the foliage in this bracket is particularly happy, and illustrates, more clearly than any example we have had, the obedience to those laws of nature that must be observed in all good ornament: radiation from the parent stem, tangential curvature of lines, and distribution of areas. The latter rule is particularly well shown in

this by the gradual diminution in surface occupied by the running ornament as it extends into the extremities of the triangular panel. The scrollwork under the bracket is not so artistically formed or well proportioned, but errors here are amply balanced by the good points of the scroll.

In Fig. 11 is shown a panel from a large candelabrum that gives a very clear idea of the treatment of Venetian arabesques. The panel is symmetrical on each side of a center line, carved in high relief in stone, and is treated in

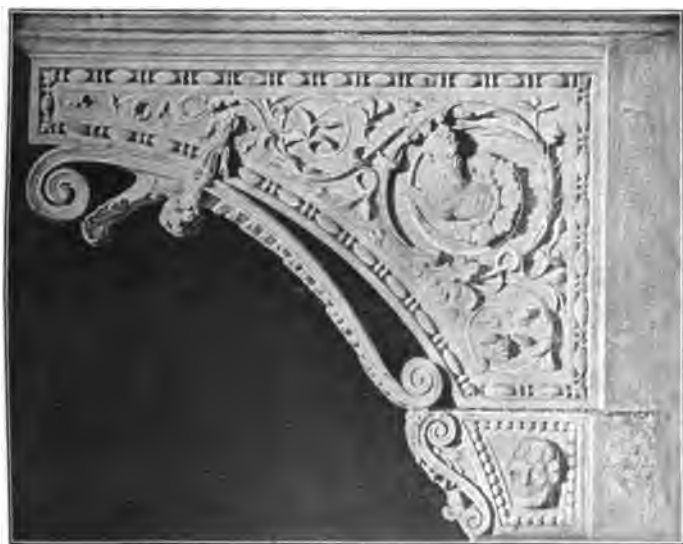


FIG. 10.

a manner that makes the ornament somewhat monotonous in itself but well proportioned to the surface it is intended to cover, with enough blank space to prevent tiresomeness in its study.

25. Ingenuity of Renaissance Designer.—Fig. 12 is a panel under the balustrade of the stairs in the cathedral at Sienna. This illustrates to a remarkable degree the ingenuity and fertility of mind possessed by the early Renaissance designer and sculptor. Here we have, forming the

running border around a trapezoidal panel, the guilloche ornament so characteristic of classic art, and the running arabesque identified with the classic-revival period; within this a modified form of the old Greek fret and then an irregular panel, the surface of which is carved in low relief with



FIG. 11.

a foliated scroll and arabesque that close study discovers is terminated at one end in a grotesque animal and at the other in a bunch of fruit.

26. Renaissance Ironwork.—Not only was art at this period exemplified in details carved in stone and marble, modeled in stucco and painted on canvas, but the iron worker executed many details that brought his trade almost to a fine art.

Fig. 13 shows a bracket from the Florence Museum, representative of a cornucopia filled with grapes and leaves.

The treatment of the scrollwork and the elaboration of all the detail of this device is peculiarly well adapted to the



FIG. 12.

purpose, and altogether this exhibits a remarkable design for a piece of work of this kind.

In Fig. 14 is shown a portion of an iron grille from the cathedral at Prato, one portion of which, based on the combinations of the circle, shows a slight leaning toward Gothic ideals, while the panel to the right is strictly Renaissance in the treatment of its leafwork and small figures; but the

general direction of its outline, with its alternate branches to the left and right, undoubtedly have their origin in the Gothic school of foliation.

It must be borne in mind that at this period there was no



FIG. 18.

separation in the branches of the art world. A man was architect, painter, and sculptor at once, and often combined these with the trade of goldsmith. The great artist Raffael designed ornaments for carvers in stone and metal, and exhibited in them the purest taste and most exquisite fancy.

27. Michael Angelo, Sculptor and Artist.—Michael Angelo was born in 1475 and was a pupil of Domenico Ghirlandajo. Having shown at an early age a strong talent for sculpture, he was given an opportunity to study in a school for the culture of sculpture founded by Lorenzo de Medici. The Medici family was banished from Florence when Angelo was 20 years of age, and the young sculptor

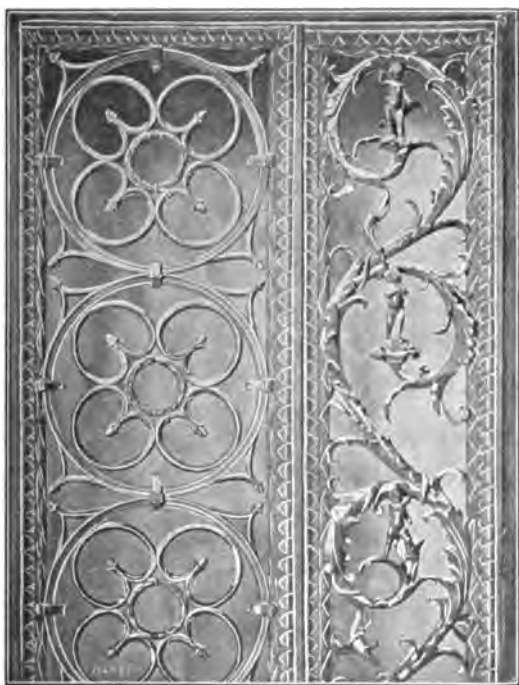


FIG. 14.

was forced to retire to Bologna, where he worked for a while on the tomb of St. Domini. He returned to Florence, however, and about the time of his twenty-third birthday finished his celebrated statue of Cupid, and also his Bacchus, which were the cause of his being invited to Rome.

At Rome, among many other works by him, is the *Pieta* now standing in St. Peter's Church. His gigantic statue of

David, at Florence, was his next great achievement, and before he was 30 years of age he was summoned to Rome by Pope Julius II for the purpose of designing his Mausoleum, for which building the famous statues of "Mosès" and "The Slaves" were originally designed.

Thus far the work of Michael Angelo has apparently been that of a sculptor, with possibly the exception of the design of the Mausoleum. His next great work, however, was the painting of the Sistine Chapel—one of the greatest of his achievements, whether we regard it purely as a work of intrinsic art or as a monument that exercised a powerful influence both on the art of a contemporary character as well as that of later times.

For Pope Paul III, in 1541, he completed his vast fresco "The Last Judgment" in the same chapel, and the remainder of his long life was chiefly devoted to the construction of St. Peter's Church, on which he was employed at the time of his death, in 1564, and for which he refused any remuneration.

During the long life of Michael Angelo, everything he executed expressed a desire for novelty, and this is the only detraction he ever seemed to have from the study of pure excellence. His daring innovations in ornament are most striking. His large broken pediments and moldings, his sweeping consoles and scrolls, his direct imitation of nature in some of his enrichments, and the amount of absolutely plain surface that he uniformly preserved in all his architectural compositions, seem to bring new elements into the field of design that were greedily snapped up by men of lesser genius than he himself possessed.

Thus the style of the Roman school became materially altered through the work of Michael Angelo. Subsequent artists, down even to Vignola himself, so far as ornament was concerned, adopted all his beauties, and defects of design, the greatest of which were an exaggeration of manner.

28. Giacopo Tatti Sansovino.—Venice seems to be the only city of Italy that did not follow the style that was

set by Michael Angelo, and this was probably due to the fact that she had a hero of her own in Giacompo Tatti Sansovino. This artist was born at Florence in the year 1479. Having, at an early age, displayed a remarkable talent for art, he was properly educated and distinguished himself by his buildings at Florence. He was then taken to Rome by San Gallo, architect of Pope Julius II, where he attracted the notice of Bramante, and made, under Bramante's direction, a large wax model of the Laocoon, in competition with other artists. Sansovino's was judged to be the best, and a bronze cast was taken of it that finally came into the possession of Cardinal Lorraine and by him was taken to France in the year 1534.

Sansovino was obliged to leave Rome on account of his health, and was placed by Bramante with the artist Perugino, who was then painting the ceiling in the Toore Borgia. Perugino was so pleased with Sansovino's ability that he caused him to prepare many models for his own use.

In the year 1514, most elaborate preparations were being made at Florence for the entry of Pope Leo X, and Sansovino was employed in the preparation for designs of many triumphal arches and statues. The works were so successful that he was given the commission by the Pope to make a design for the facade of San Lorenzo, in Florence. After this he continued in Rome and was employed both in sculpture and architecture, and was the successful competitor for the church of St. John, of the Florentines, against Raffael and Antonio San Gallo. From this on he was engaged on work of importance in Rome until the year 1527, when Rome was taken by the French, and Sansovino sought refuge in Venice, intending from there to visit France, where the king had offered him employment. The Duke Andrea Gritti, however, persuaded him to remain and undertake the restoration of the cupolas of St. Mark's Church—a work that he performed so successfully that he was appointed to a public office, given a house, and provided with a stipend. It was to this appointment that Venice owes so many architectural monuments that are among the finest examples of Italian art.

FRENCH RENAISSANCE.

29. Rapidity of Transition.—The transition from the style of the Middle Ages to the style of the Renaissance, that took place so gradually in Italy, was in France sudden and complete. The campaigns of Charles VIII, Louis XII, and Francis I in Italy brought them in contact with the wonderful art productions of that country, and filled them on their return to France with an ambition to rival the splendid palaces and gardens of Italy, for which purpose they took with them Italian artists to act as instructors to the French. However, although these imported Italians introduced many classic elements and details into French art, they failed to dominate the natural spirit of the French master masons and architects in matters of general composition. Therefore, the early French Renaissance is wholly unlike that of Italy, from which it derived only a few minor details and the impetus that carried it forwards. On account of its possession of greater originality than the Italian style, and its freedom from the baser incongruities that prevailed in the Renaissance in Germany and England, we can take the French style as a good standard, and study it as a revival of classic art modified almost perfectly to fit more modern ideas. It is important in studying the French Renaissance to bear in mind the periods into which it is divided and subdivided, and also to bear in mind the dates of these periods. In modern practice, when any designs are executed in any particular style, the French styles more than any others are rated according to their period rather than nationality.

30. Periods of French Renaissance.—French Renaissance may be divided into three general periods: (1) *Valois period*, or *Renaissance proper*; (2) *Bourbon*, or *Classic period*; and (3) *Rococo period*.

1. *Valois Period.*—The Valois period extends from 1483 (about the time of the invasion of Charles VIII into Italy) to 1589 (about the end of the reign of Henry III). This may be subdivided into: (a) The Transition period, comprising

the reigns of Charles VIII and Louis XII and the early years of Francis I, extending from 1483 to 1515. This period is characterized by a picturesque mixture of classic details and Gothic ideas: (b) The style of Francis I, or Early Renaissance, extending from about 1520 to 1547. The ornament of this period is distinguished by its great variety and grace of composition and the exquisite beauty of detail. (c) The Advanced Renaissance, combining the reigns of Henry II, Francis II, Charles IX, and Henry III, extending from 1547 to 1589, and distinguished by the general adoption of the classic proportions in the orders and a decline in the delicacy and originality in the treatment of the ornament. In other words, this period represents, as did the later Renaissance of Italy, an attempt to actually reproduce all classic forms.

2. *Bourbon Period.*—This period of the Renaissance extends from 1589 to 1715, covering the reign of Henry IV and of Louis XIV. This may be subdivided into the style of Henry IV, covering entirely his reign and part of the reign of Louis XIII, extending altogether from 1589 to 1645. The distinguishing characteristic of this period is the excessive use of the classic orders and other forms with a heavy, bold, florid ornament. The style of Louis XIV begins during the reign of his predecessor and extends to the time of his death—from 1645 to 1715. This is the great age of classic architecture in France, wherein the luxury and wealth of the nation and its desire for splendor exceeded its taste in art and represented in its architecture an attempt at the grandeur of Rome.

3. *Rococo Period.*—This period may be considered the decline, and is distinguished by the marked extravagance of detail derived from the leaf and other ornamental forms of previous periods, combined with rock and shell forms, so capricious as to be absolutely meaningless.

This period of French Renaissance terminates in what is known as the *Empire style*. This consisted of a strong protest against the frivolity of the ornament of the Rococo, and a return to the actual detail of more classic forms. As it

progressed into the nineteenth century, it expressed itself under the reign of Napoleon, as emperor, and attempted to produce the grandeur of Imperial Rome.

France had conquered the greater part of Europe, and believed that she was to set up a universal empire covering the entire country, as Rome had done, and with this idea in mind, built triumphal arches, columns of victory, gorgeous palaces, and country châteaux, and in every way lavished money on public and private monuments, in an endeavor to visibly express her imperialism.

31. Castles and Châteaux.—The transition from the Gothic to the Renaissance is more clearly expressed in the châteaux, or country residences, of the nobles than in almost any other class of buildings, and for that reason we will confine our discussion largely to a few of these interesting edifices.



FIG. 15.

We have seen how the castle of the Middle Ages was built mainly for defense, its ornamental features being merely an embellishment of the necessities that were prominent in its construction. Such was exhibited in the general appearance of the castle of Coucy, Fig. 123, *Historic Ornament*, § 4.

The remodeling of these Gothic castles to suit the taste of the Renaissance brought in many incongruous but very picturesque ideas. In Fig. 15, a view of the castle of Azay-le-Rideau, it will be observed how the towers and turrets characteristic of the old style are retained, how the upper portions are still carried out on bold corbels, and their tops

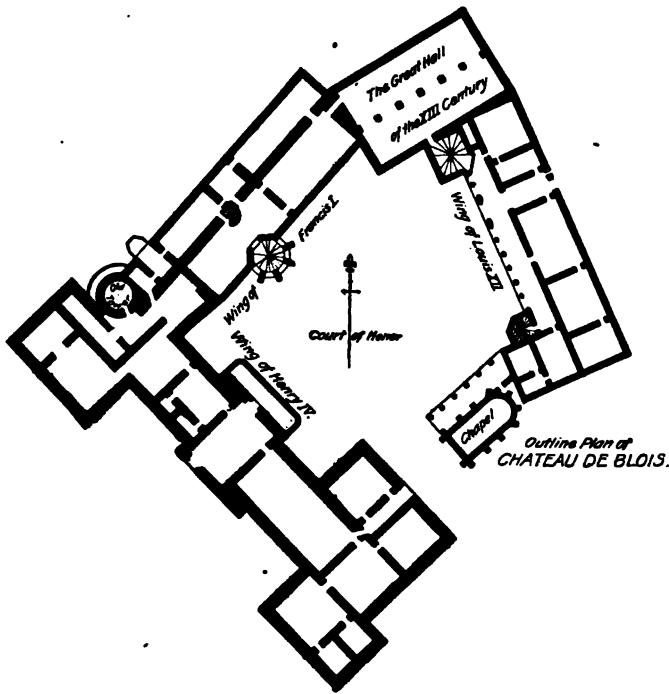


FIG. 16.

roofed over in a cone; but the drawbridge, the moat, and the portcullis have disappeared. Broad airy windows diminish the extent of blank wall surface characteristic of feudal times, and pilasters each side of the windows, topped with classic capitals and carved in rich arabesque, show the adoption of Italian art. The plan, composition, and grouping of the parts are still French and more or less feudal, and the Italian art has only affected the detail.

32. Château de Blois.—The largest, and, in many respects, the most important, of these country residences of royalty is the Château de Blois, and this we will consider in detail, as within it may be traced the gradual transition of each phase of the French Renaissance, from the time of Louis XII to the time of Henry IV, thereby including the entire Valois and a part of the Bourbon period of this style.

In Fig. 16 is shown a plan of this structure, the irregularity of which gives evidence of its medieval origin. About the



FIG. 17.

year 1500 Louis XII remodeled the east wing, which bears his name, a front view of which is shown in Fig. 17. In this may be seen the elliptical arch, the clustered column, the

high-pointed gable, and the slender pinnacles whose origin can be traced to medieval days, but the introduction of flanking pilasters and arabesque ornament, though here but sparingly seen, is suggestive of the change to come.

On the outside of this wing, the archway that leads through to the "Court of Honor," shown in Fig. 18, is flanked on each side by heavy piers, over which is a conventional Gothic niche wherein, against an elaborate background of fleur-de-lis, rides King Louis XII on his charger. To the right of this is a little doorway that gives the pedestrian access to the passage, and over this entrance, in bas-relief, is carved a porcupine, the emblem of Louis XII, and a knotted cord for Anne of Brittany, his queen. Of these emblems we will have more to say later.



FIG. 18.

We will now turn to the wing of Francis I, on the northwest side of the court. This was erected but fifty years after the one we have just considered, but the difference in style is manifest even to the most casual observer, as shown in Fig. 19.

33. French Conception of Roman Ideas.—The artists of the sixteenth century, hurried along by the swift current of fifty years of wonderful intellectual regeneration, seemed to arrive at a comprehension of the use that the Romans had made of the Greek orders. They seemed to understand that the orders were not used in Rome as elements of construction, as they had been in Greece, but as decorative details having no essential relation to the construction itself. They seemed to comprehend by instinct that there was no reason why they should not take those same Roman orders and details and use them in any way they chose—structural or

non-structural—so long as their use suited the purpose to which they were applied.



FIG. 19.

Thus a study of this period of French architecture shows that the French builders accepted not the conventional

restrictions of the classic formulas, but the spirit of these formulas, as an organized system of ornamentation. A study of the court facade of this Château de Blois shows that the lessons in classic styles given by the imported Italian masters were accepted by the French architects with respect and intelligence, but not learned by rote. The Italian rules had an influence, but were not accepted as a law.

34. Octagonal Staircase.—The greatest artistic effort of this period was probably the octagonal staircase that appears in this facade. It is considered one of the masterpieces of the sixteenth century, though it is at the same time an example illustrative of the audacious independence of the



FIG. 20.

French architect. It has no architectural relation to the wall surface from which it protrudes, except that its four great free-standing buttresses support a cornice and balustrade that are a continuation of those on the wall. These buttresses are niched and contain exquisitely carved figures, while between them extends the balustrade of the stairs,

divided into panels carved with the crowned salamander emblematic of Francis I, and in other places with the monogram F and C under a crown, standing for Francis, and Claude, his queen.

In Fig. 20 is shown a large detail of this salamander device, and the form of its crown, decorated with fleur-de-lis. This



FIG. 21.

is the key of the period and style, as was the crowned porcupine a key to the style of Louis XII. The fleur-de-lis will be found on nearly every detail connected with French royalty, as it was adopted originally by Hugh Capet, the first king of France.

If we now go into this castle and wander through its rooms, we will find many details typical of the spirit of the French people and suggestive of their love of display and art. We will be able to judge largely the period of each particular room by the emblems characteristic of the reign.



FIG. 22.

35. Development of the Fireplace.—It was about the beginning of the Renaissance period that the chimney as a means of carrying off the smoke was introduced into France, and in the Château de Blois we see the full development of the fireplace. Therefore it will be well to make a

study of these details by themselves, inasmuch as the student can then make a better comparison.

36. In Fig. 21 is shown an old mantel that stood at the end of the great hall of the States General. Its design is Gothic in feeling, as is plainly shown by the crockets around its cornice. The columns either side of the opening are carved with Gothic capitals, and the ornament extending across the top of the opening is Gothic in its detail, though indicative of the influence of the Renaissance arabesque.

In Fig. 22 is shown a mantel of the hall of the Guards, the details each side of the opening of which, as well as the panel across the top of the opening and the frame panel over the mantel, are certainly Gothic in feeling. The pilasters at each side of the mantel, however, and the capitals at their tops, are certainly of Italian origin and design.

These two examples, particularly Fig. 21, give a good idea of the earliest ornamental mantel used in French art, and are typical of the designs in use at the close of the fifteenth century.

37. Heraldry.—In Fig. 23 is shown the mantel known as the Mantle of Crowns, on which in high relief we find the crowned porcupine emblematic of Louis XII, together with the crowned initials L and A, standing for Louis and Anne of Brittany, his queen. Around the frieze is a knotted cord that also is emblematic of Anne of Brittany, and in later years was used by some queens as a sign of widowhood. The dolphin forming the background of this mantel, and bearing the crown of France, appears as a detail in many French designs emblematic of heirship to the throne, the nearest heir to the throne in France being called the Dauphin—a word derived from the dolphin, that fish being the emblem.

Another interesting detail in this design is found above and below the knotted cord, around the frieze; above is the conventional fleur-de-lis emblematic of the kings of France, and below it is the conventional form of ermine emblematic of the queen, Anne of Brittany.

In Fig. 24 is shown another mantel from the Château de Blois, of the period of Louis XII, in which the crowned porcupine and the crowned ermine are each displayed in separate panels, the ermine in this case being shown as a complete animal instead of the conventional form representing its fur,



FIG. 22.

as displayed in the previous figure. The moldings of this mantel and its general outline and proportions are strongly suggestive of the Gothic style, but the treatment of the arabesque at each side of the panels, the carving of the three-quarter columns that mark the separate panels, and the frieze over the fireplace, show conclusively their Italian

origin. It will be observed that the initials L and A are repeated across the top of the chimney, and the background of the panels containing the reliefs of the porcupine and



FIG. 24.

ermine are each diapered with the fleur-de-lis and conventional form of ermine fur.

38. In Fig. 25 we have another mantel of this same period, where the frieze over the top of the fireplace opening is evenly divided between the crowned initials of the king and queen, on a fleur-de-lis and ermine background, typical of their houses or families. The crowned porcupine between

the two—the symbol of Louis XII—appears in nearly all designs executed during the reign of that king. Above the fireplace are the figures of two angels, supporting the crown of France, and the shield bearing the escutcheons



FIG. 25.

of both the king and queen. A little observation of the detail at the top, and the moldings of the columns, will show that the Gothic influence still pervaded the art of the period.

In Fig. 26 is a chimney with the emblems of Anne of Brittany. The elaborate A and knotted cords against a

background of ermine, together with the entire treatment of the design, is suggestive only of the house of the queen, undivided with that of King Louis.

Fig. 27 shows a mantel wherein no initials occur to indicate to whom or what period it belonged; but we can easily



FIG. 26.

judge from the presence of the knotted cord in each of the side panels, and the existence of this device as a border to the center panel, and its stenciled background of ermine and fleur-de-lis, over which the shield surrounded with shells has been placed.

39. In Fig. 28 is shown a mantel of the later period—that of Francis I—a fact that is clearly declared by the presence of the *salamander* in its design, a word concerning which might be necessary. The salamander is a mythical



FIG. 27.

animal supposedly so cold blooded that it will actually quench fire when placed within it, and the design here shown expresses this idea of the salamander, standing on a bed of coals and surrounded by flame that he is supposed to quench by the coldness of his breath.

The details of this mantel are very classic. The capitals of the columns are derived undoubtedly from the Italian Renaissance. The acanthus leaf forming the bracket at the



FIG. 28.

corners of the mantel, and the bracket over the crown, as a sort of clumsy keystone in the center, are decidedly Italian in their molding. The mantel is chiefly interesting by its strong personality and association with the reign, period, and person of Francis I.

40. In Fig. 29 is shown what is called the Chimney of the Fleur-de-lis, the upper background of which is stenciled

exclusively with fleur-de-lis, and bears in its center the crowned shield surrounded by shells.

We now arrive at Fig. 30, a mantel in a room known as the Cabinet of the Queen, and here we get the severe clas-

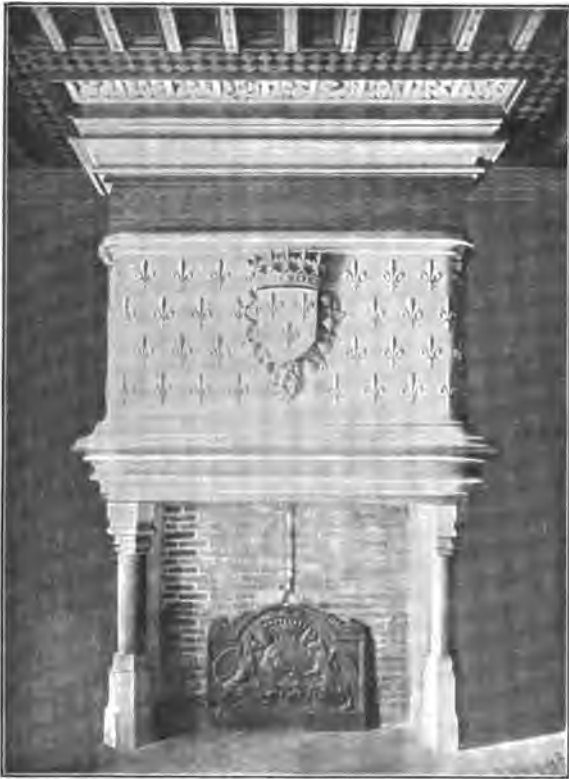


FIG. 20.

sicism characteristic of the period of Henry II. The pilasters each side of the mantel, and the panels of the wall, all richly carved in arabesque, and the frieze over the top of the mantel, with similar ornament, show the predominating influence of Italian art. The background of the upper portion of the mantel, with its stenciled H and fleur-de-lis,

and the oval cartouch or modillion in the center, with its crowned H surrounded by laurel leaves, stamp this design characteristically with the period of Henry II, while a small cartouch in the center of the mantel over the fireplace opening bears the initials H

and C, standing for Henry, and Catherine de Medici, his queen.

The study of these designs and escutcheons is of particular interest to the student, as nearly all detail of the French Renaissance period can be classified easily by bearing in mind the heraldic symbols characteristic of each reign and period.



FIG. 30.

41. Wall and Ceiling Decoration.—

No less interesting than the mantels of this celebrated château are the decorations of the walls and ceilings with the characteristic surface ornament of the period.

The same monograms and initials are here

found in embossed leather, surrounded by richly foliated ornamentation in strong colors and gold.

In Fig. 31 is shown a room known as the King's Chamber, the walls of which are decorated with a repeating pattern at regular intervals, within which we find the initials H and C, for Henry and Catherine, the king and queen. An enlarged detail of this wall decoration is shown in Fig. 32, and is

valuable as a characteristic wall treatment of the period of this French Renaissance.



FIG. 31.

In Fig. 33, the decorations of Queen Catherine's chamber may be seen, and it is interesting to note that in each of

these rooms there is an abrupt termination between the wall decorations of the main room and the dado or wainscot of the niche or alcove, no attempt being made to blend the two

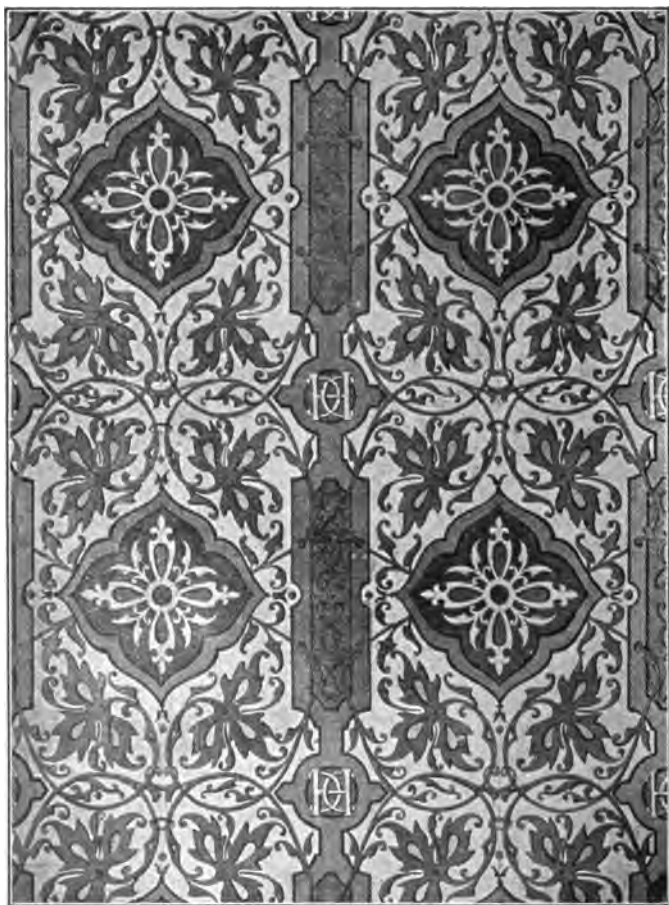


FIG. 82.

patterns so that they die or fit into each other. The independence expressed is in perfect accordance with that already spoken of in the arrangement of the buttresses of the great staircase.

Beyond this room, through the open doorway seen in Fig. 33, is another apartment, the walls of which are treated



FIG. 88.

with a surface decoration shown in Fig. 34. The single letter H under the conventional crown indicates this apartment to

have been decorated in the period and style of Henry II, and a little study of the design in comparison with Fig. 32 will show the simplicity and neatness of the earlier style as



FIG. 84.

compared with the later one. Fig. 35 shows a third example of the wall decorations of this château.

These wall decorations are very valuable to the interior decorator of today, inasmuch as they furnish him with a

clear suggestion of the style of interior work during the Renaissance period, of which so few examples are in existence at the present time.



FIG. 35.

42. Fontainebleau and Versailles.—During the decline of the Renaissance to the period of the Empire, the seat of government and the royal family were centered in Paris, and the palaces of Fontainebleau and Versailles are the

most important, with the exception of the Louvre, of the many palaces of France. They are both built up of sections that vary in style and age from the fourteenth century to the present day, but in each of these parts the greatest architectural interest centers in the details of the period of Francis I and his immediate successors.

The details of this style of architecture, as seen in Fontainebleau and Versailles, are more urban than those from the châteaux we have just been considering, and, though all these buildings in their proper sense were palaces, yet the two structures in present consideration were always spoken of as such, inasmuch as they were the city residences of the king in distinction from his country seat.

43. Variation of Styles.—In the rooms of these palaces can be seen the furniture and decorations whose style is typical of French art during each period of the Renaissance and at the height of its glory. Here, during the reigns of Louis XV and Louis XVI, we have the style of furniture characteristic of and known by the names of these monarchs, as well as that dainty specific style of design called *Marie Antoinette*. After the year 1662, French furniture can be roughly divided into four styles, corresponding to the four monarchs under whose influences its manufacture was carried on. These are: *Louis XIV*, *Louis XV*, *Louis XVI*, and *Napoleon*, usually called *Empire*.

As in all cases of subdivision into periods, there is a transition from one period to another that makes the styles overlap one another, and the distinctive characteristics of each cannot be applied with certainty. The dividing lines in the case of French furniture, however, are more clearly drawn than in other art details, inasmuch as each style seems to have been the result of a court fashion that depended largely on the taste of the reigning monarch.

44. Louis XIV loved pomp and grandeur, and the forms of Louis XIV furniture are bold and severe in line and proportion—a fact that kept them from appearing gaudy in

their excessive gilding. A great desire in furniture at this period was magnificence, and native woods were set aside in preference for foreign woods from India and America. Rarity of material was of more importance than any other detail, and artistic composition was now relegated to an inferior place. The effect of this was to make the details small, as the use of costly materials required that they should be treated with care and that even the smallest fragments should be used.

45. Introduction of Costly Materials.—A great difference was thus established between the old-fashioned joiner, faithful to the carving of native woods, and the cabinetmaker to the king, whose care was to produce objects of magnificence. In other words, vulgarity was introduced into the scheme of ornament, and brilliant and costly materials were used solely for their expression of brilliancy and costliness; and it is from this standpoint that French furniture of this period must be regarded. The skill lavished upon it and the fancy and variety that characterizes its design and the minuteness of its workmanship in inlaid surfaces, graven and chiseled brasses, and the ingenuity of its construction and expense, can then be appreciated.

46. Discouragement of Symmetry.—During the period of Louis XV, furniture loses the dignity of outline and proportion that characterized that of the previous style, although it possesses all the brilliancy and gaudiness of the former. Another detail of importance between these two styles is that in the Louis XIV work symmetry was not distinctly observed, as the great effect of varied light and shade was enhanced by the abruptness of unsymmetrical parts. In the period of Louis XV, this eccentricity became a law, and symmetry became not only a detail of no consequence, but a thing not to be encouraged. This caused the design to reach the height of irregularity, and the style took the name of **Rococo**—a term in the French language meaning frivolous.

In this eccentric ornamentation other details figured, and

roses, cornucopia, vases, scrolls, etc. are interwoven with a great predominance of shell-like forms. There is nothing in the entire range of art acting as an example or prototype of this Rococo idea. Every shape and line throughout it is twisted and turned until it is almost a deformity; the ordinary acanthus scroll was carried into an endless reedy foliation. Nature appeared to be looked upon as a rude and barbarous affair that needed some dressing of French taste, and yet some specimens of Louis XV furniture impress us both with the actual skill of the man that did the work, whether in metal or wood, and that the pieces of furniture are themselves marvels of decoration. These twists and turns, though absolutely meaningless, seem to have an object. They reflect the light from gilded metal in a thousand different ways, and from a thousand different points, while the high relief affords an abundant play of light and shade amidst this brightness. Toward the end of the reign of Louis XV, a reaction set in against these absurdities, simply because the exaggerated style was being carried beyond reasonable limits.

47. Under the reign of Louis XVI, the furniture is similar to that of his predecessor, inasmuch as the festoons, garlands, gildings, and shell decorations still exist, but the shape of the chair, and the care and study expended on it, is very different. Refinement is evident in every one of its lines and proportions. The earlier chair, with sprawling legs—called the *cancan*—was not to be accepted during the reign of Louis XVI, but to be departed from as widely as circumstances would permit. During this period, we find none of the bandy-legged forms of the chair and table characteristic of the previous style, but straight-turned and sometimes fluted shafts imitative of attenuated vases or cups, or suggestive of little columns or colonnettes. The gilding was used, not entirely over the surface, to increase the gaudy appearance, but in lines, to accentuate the fluting of the column-like legs more than to emphasize the curves of the moldings that were turned according to Greek ideas.

48. The entire interior decoration of this period partook of a similar reformation. The panels of the rooms were divided into straight lines, and omitted all details of the rococo flourishes. These panels were painted white, and the pilasters between them were carved in rich and delicately executed arabesque.

The whole scheme of decoration of this period was equally elaborate and rich with that of its predecessors, and various articles of furniture were made of tulip wood, laburnum, or of rosewood, and on other occasions they would be executed in lighter wood, colored in various gold and brown shades by means of a hot iron. The chief ornament was marquetry of elaborate pattern, usually in floral garlands with borders of fine diaper work. The chairs, beds, and couches were usually upholstered in fine Gobelin tapestry or costly French and Italian silks, all of which were further enriched by beautiful metal mounts, while inlaid bits of Sèvres porcelain added a delicacy to the whole.

GERMAN AND ENGLISH RENAISSANCE.

49. Influence of Italian Art.—Renaissance ornament penetrated into Germany at an early period, but was not particularly popular at first, and took no hold on the hearts of the people until the spread of books and engravings prepared the way to the adaptation. From an early period there had been a steady current of artists leaving Germany to study art in Italy, and the return of these affected many of their countrymen.

50. Albert Durer, a German artist and illustrator, in many of his engravings, showed a perfect understanding of the conditions of Italian design, leaning occasionally to the Gothic style of his early master and on other occasions to the Italian style of his more recent studies. The spread of these engravings undoubtedly influenced the German taste, but, even at its best, the Renaissance of Germany was impure. The inclination of her people for

difficulties that could be solved by the hand rather than by the head soon led her into strapwork, jeweled forms, and monstrous devices more animated than graceful, but exhibiting fully the delight of the clever mechanic to execute details that were difficult to handle but easy to conceive.

51. Introduction Into England.—The introduction of Renaissance art into England dates from about the year 1518, when Henry VIII employed an Italian architect to design a monument in memory of Henry VII, which still exists in Westminster Abbey and is almost a pure example of the Italian style of that period.

The same architect designed a monument of the Countess of Richmond at Westminster, and shortly afterwards left England for Spain, leaving behind, however, a number of Italians attached to the service of Henry VIII, by whom a taste for the Italian style was thoroughly inoculated into the country. Among these was the architect John of Padua, who appears to have done more work than any of the others, among the most important of which is the old Somerset House, built in 1549.

At the time these Italian artists were spreading a taste for Italian architecture and sculpture throughout the length and breadth of England, another influence was at work to temper this style and prevent its being accepted in its purest form.

52. Holbein.—In 1524, the celebrated German artist Holbein came to England from Holland, and to him and John of Padua is due mainly the resulting style of architecture that appeared in England during the reign of Elizabeth. Holbein was a man of great individual genius as a painter, and naturally inclined to establish the taste of the German school in England, and, though he died in 1554—thirty years after entering the country—his influence on John of Padua is plainly seen in the results of that architect during the subsequent years.

53. Dutch Influence.—At the time of Elizabeth, a number of artists came over from Holland, built several buildings, and painted many portraits, and, though these artists and architects were thoroughly imbued with a taste for Italian art, that taste was certainly affected by their Dutch surroundings and education.

Theodore Haveus, of Cleves, was architect of four gates of Caius College, in England, built toward the close of the sixteenth century, and at this time it appears that most of the Italian architects had left the country. There were many English goldsmiths and jewelers, as well as a number of artists and architects, whose names appear prominently at this time, and all this jointly had the effect of conglomerating the Dutch, Italian, and English-Gothic style of art.

54. Political Ties of England and Holland.—During the reign of Elizabeth we meet a great preponderance of Dutch names, considering that it was an English country, which is accounted for by the fact that England was bound by political and religious ties with Holland; and although the greater number of these names are applied to artists and painters, it must be borne in mind that all the arts were connected closely in those days, and artists and sculptors were frequently employed to design models for ornament and even for architecture, and, in the accessories of their own pictures, found frequent opportunity for the exhibition of ornamental design.

Michael Angelo was an artist and painted the ceiling and side walls of the Sistine Chapel, at Rome; Michael Angelo was a sculptor and carved much of the statuary that now stands in the corridors of some of the most prominent museums of Europe; Michael Angelo was an architect and completed the building of St. Peter's Church, in Rome, the most stupendous undertaking of the age and the largest structure now in existence.

55. Influences on English Art.—During the early part of Queen Elizabeth's reign, we are then justified in

concluding that a most important influence must have been exercised on English art, through the medium of the Protestant states and low countries and also of Germany.

Heidelberg Castle, in Germany, was completed about this time, and it is not unlikely that this, too, had an effect on English art, especially when we consider that Princess Elizabeth, daughter of James I of England, was queen of Bohemia, and held court at Heidelberg about the beginning of the seventeenth century. Records show that toward the close of Elizabeth's reign, and about the beginning of that of James I, English artists seem to have predominated, and it would appear that at this time would be found the most likely development of a strictly native style. It is to be deplored, however, that this period of English art, known as *Jacobean*, is undoubtedly the most inartistic, inappropriate, and ill-composed in all history.

56. Elizabethan Ornament.—Thus we may expect to meet with the purest Italian ornament during the reign of Henry VIII. During the reign of Elizabeth, his daughter, we perceive but a slight imitation of the Italian models and an almost complete adoption of the style of ornament practiced by the decorative artists of Germany and the Netherlands. In the reign of James I, Elizabeth's successor, we find this same style continued, or attempted to be continued, by the English artists, but in a large and gross manner.

57. Characteristics.—There is little, then, that can be justly termed original in Elizabethan ornament. It consists more of an adaptation of foreign elements—an adaptation of elements with which the adapters had no intimacy, and about which they had little understanding. The characteristics of Elizabethan ornament may be described as consisting chiefly of a grotesque and complicated variety of pierced scrollwork with curled edges, as though a number of short straps were interwoven and their ends allowed to curl up; of interlaced bands, sometimes on a geometrical pattern, but more often

flowing irregularly and capriciously; bands composed of strap and nail-head ornaments; festoons of fruit and drapery interspersed with roughly executed figures of human beings; grotesque monsters and animals, with here and there large and flowing designs of natural branch and leaf ornament. High-paneled apartments often filled with designs of foliage, shields, and coats of arms, grotesque keystones in arches, and immense flowing brackets, are freely used; and the carving, whether in wood or stone, is always very roughly and crudely executed, and the design coarse and ill-adapted to the material in which it is executed.

Unlike the adoption of the Classic style in Italy and France, these ornaments are not applied to a Gothic system of construction, but the entire building is masked under a coat of plaster or other material, and the groundwork of classic simplicity is first laid, to receive the meaningless ornament that stamps the period.

58. Revival of Antique Art.—About the beginning of the sixteenth century, the revival of the **antique art**, which we have already discussed, in Italy became invigorated and reduced to a system, as we have said before, through its popular introduction afforded by the means of printing and engraving. Translations of the work of Vitruvius, copiously illustrated and ably commented upon, were printed and spread so as to become the foundation of work for every designer of eminence throughout the country, and at the same time offered a suggestion on which at least half a dozen other writers prepared treatises on architecture, among them Palladio and Vignola, whose works have been preserved and form the standard down to the present day.

59. Architecture and ornament during the period of the English Renaissance may be considered as failures from an artistic standpoint. The purest ornament developed during this great historical period we find in France, where it was uninfluenced by any foreign elements of importance except those received from Italy with the style itself.

CONCLUSION.

60. Object of Complete Reviewal of Historic Ornament.—Thus we have considered the entire range of historic ornament, from the earliest days of Egypt to the beginning of the nineteenth century. The object of this study has not been to acquire a number of forms that were characteristic of each period, that the student might copy or imitate outlines and designs of the past, in order to execute ideas characteristic of a certain historic period. The purpose has been to train the mind in order that the natural developments arising from conditions in the past can be applied to the probable conditions that would arise under similar circumstances of the present day and the future.

61. Influences Affecting Styles of Art.—It has been pointed out that religion, politics, and geography have affected the character of ornament in different countries, as well as historic influences, and at the present day we find that the majority of the ornament is affected by the inventions and advancement in science and art characteristic of the nineteenth century, as was the Renaissance period characterized by the advancement of learning in its period. In fact, the latter half of the nineteenth century has been characterized by some writers as a **New Renaissance**, if such a term can be reasonably used. It certainly bears a similar relation, to the three hundred years that preceded it, that the beginning of the Renaissance period bore to the centuries before its dawn.

62. Effect of Environments on Art and Architecture.—In the fifteenth century, we have the introduction of books to the masses of people, through the invention of the printing press and printing. A spread of desire for art and learning followed as soon as the antiquities of Rome and Greece were learned, and with this development of the human mind, a rapid advancement of civilization took place that characterizes the period as one of the most brilliant in history.

In the same manner, we have a number of inventions characteristic of the latter half of the nineteenth century that have so changed the conditions of man that his entire habits and character are different from those of his ancestors in the Renaissance period. Steam and electricity have been controlled so as to convert night into day, and make it no longer necessary to discontinue any line of work or manufacture at sunset. These same agents have rendered the distances between business centers—even on two continents—matters of only a few hours' or days' travel. Conversation between individuals a thousand miles apart is so easily maintained that it may be considered that space, from a business standpoint, is practically annihilated, and, with a hundred other inventions, we are confronted with a proposition in design today that makes the traditions and devices of past ages simply symbols of antiquity.

The modern mind is so imbued with mechanics and inventions that the present age can give little time to the study and development of a national or characteristic art. Designs of the past have been copied, and we are satisfied to imitate what has been done in this line, instead of trying to do something for ourselves. The human mind has not attempted to invent practical art forms, and years hence the study of the art of this period will be considered in much the same terms that we now consider the art of the Jacobean period in England.

63. Adherence to Old Designs.—A simple illustration of this may perhaps be seen in the ordinary chandelier, or hanging light. In the days when candles furnished all the light for rich and poor that was obtainable, it was customary that a rod or bar should hang from some portion of the room and support on its end one or more candles. The introduction of lamps to general use made it necessary that there should be a bulb or metal globe somewhere near the bottom of this rod, to be filled with oil to supply the lamp that still was suspended from the ceiling by a rod, or, occasionally, a chain. With the introduction of gas as illuminating

power, the rod was replaced by a pipe, still in imitation of the old rod, but serving the double purpose of supporting the chandelier and conveying the gas to the burner. The horizontal bars that formerly carried lamps now carry lava tips from which the gas burns, and the large round balls or globes that originally contained the oil to supply the lamp are now false, hollow devices, used to cover the joints where the vertical and horizontal bars are united.

In addition to this, elaborate designs for gas fixtures often introduced long chains from various portions of their cross-bars to staples in the ceiling, suggesting that these fixtures were hung from the ceiling by chains, as the lamps of old—a clumsy deceit, inasmuch as the chains nearly always hung loose and the fixture was plainly supported by its central pipe.

From a point of design, nothing could be more inconsistent than to borrow the chain that hung the lamp of our ancestors and use it as a decorative element where it was allowed to hang in a limp curve, on account of this outline being more pleasing to the eye. The reason for this is to be found in the fact that the designer did not invent new conditions to suit the new material. Had he never known of chandeliers for candles and lamps and been called upon to design a device for gas, there is no doubt he would have done much better. His knowledge of historic ornament in lamp fixtures, therefore, did not benefit him, but injured his ability to design something original for gas, and now, with the introduction of electricity, many are continuing in the same error today.

64. All that is required for an electric-light illumination is a pair of small wires to convey the current, and a bulb in which the incandescent fiber is enclosed. The designer is free to use these two agents in any form he pleases, to elaborate them in any way he chooses, and to produce an equal illumination of a room in the simplest and most artistic way that circumstances can possibly admit. Yet, the majority of our electrolier designs are based on developments of the

old gas fixtures, or, in some instances, going back to the old candelabra of our forefathers, where tiny lights are poised on the ends of glass imitation tapers, designed with the ornament and after the style of the old dim candles of the sixteenth century, but burning with the brilliant electric illumination of the nineteenth century.

65. Use of Historic Ornament in Designing.—In making use of historic ornament for a matter of design, there are two methods the student may legitimately pursue. He may make a design for any purpose whatsoever, which he may call after the style of Louis XII, for instance, and to carry out his idea, may honestly and confessedly borrow details from prominent châteaux or castles and carry them out with all the crude simplicity of this Medieval period. Or he may accept only the spirit of the period and produce designs that are copies of nothing that has ever existed before, but are applications of the simplicity and sternness of the necessities of that time to the change of conditions existing in his new surroundings. In other words, he may duplicate a historic building, in some cases, to produce an emphatic suggestion of a historic period, or he may erect an entirely new structure that is designed of modern materials and with modern methods, but the spirit dominating that is similar to the spirit of the time he would have it represent.

Another illustration of this point may make it more clear. A sitting room or library that is to be decorated in the so called Gothic style need not be trimmed with antique oak, carved with deep moldings, and furnished with uncomfortable high-back chairs that run to a point, with finial and crockets, after the shape of church windows, but it can be decorated and furnished in the spirit of that period, with furniture more suitable to modern times. It need not be oak if mahogany suits better, nor need the chairs be high back or pointed. The treatment of this interior will consist more of an avoidance of what is wrong than of an introduction of what is absolutely correct.

Carpets on floors were practically unknown at this period, and some of the richest palaces had floor coverings of no better material than straw; but in the nineteenth century we require carpet, and our Gothic interior need not be made as crude as a barn in order to be correct; we can use hard-wood floors and rugs, or if carpet is more desirable, we must avoid colors and designs that are inconsistent with the spirit of our purpose.

66. Window and Wall Ornamentation.—We must remember that glass was scarce and expensive at this time, and that in most cases the windows were large and filled with small panes—first, for the admission of sunshine and air, and, second, for economy. But glass is cheap now, and it is not necessary that we should divide our windows up into a multitude of trivial openings, in order that our panes may be small, because they were in the Gothic period. Leaded glass and stained glass existed in those days and can be used now to obtain any effect we desire that is consistent with our purpose. Walls were hung with tapestries at that time, whereas to-day the paper manufacturer has, for economical reasons, crowded the tapestry industry into a comparatively second place, except for the very wealthy. However, we can cover our walls with paper if we choose, but its design should not be suggestive of any period but the one we have in mind.

And so throughout, all our efforts may be carried out with the material we have in hand or available at the present time, if we but stop to consider the reason for certain things in the past and a reason why they should or should not be reproduced in the present.

67. This same suggestion applies to the designer of fabrics of all kinds as well as to the decorator, and, whether executing a design for a carpet, wall paper, dress fabric, or linen damask, it is a simpler matter, if its practice is once started, to imitate the spirit of any age or style than it is to attempt to copy the elements of existing designs.

HISTORIC LETTERING.

68. Lettering does not in reality form a part of Historic Ornament as the various other ornamental details do, but it is here introduced with the explanation of the characteristics of each style, in order that it may be associated with the ornamental style of each characteristic period. We all know that there was no such style of alphabet as we term Antique Egyptian extant in ancient Egypt, but we do find letters of this character in certain Roman works executed at a late period on Egyptian soil, and it is from these that it derives its name. The styles of letter here given must all be accepted with a certain amount of liberality, as each, though in harmony with the period it represents, has certain modern characteristics introduced for purely commercial advantages.

69. The practical designer is frequently called upon to execute ornamental lettering appropriate to some historic style and in harmony with some practical purpose. For this reason the student is herewith given a number of useful alphabets, with a brief description of each, that will enable him to execute the outlines of each letter properly and proportion them according to rules. The titles given to these alphabets are names by which they are known in modern use and explain themselves.

There is no rule by which one can determine what style of letter is best suited to each particular purpose, but it is well to bear in mind that legibility is always the first consideration, and where the lettering of a design is intended to convey direct information, as in a sign or piece of advertising matter, the lettering should be simple and clear in order that the purpose of the design may not fail. On the other hand, where the lettering is for a certificate, diploma, memorial, or other piece of matter that is more ornamental than instructive, the lettering may be elaborated to any degree within reasonable limits. The relative amount of space covered by letters and background is a matter of design that is considered in the same manner as spotting,

ANTIQUE EGYPTIAN

A B C D E F G H I J K L

M N O P Q R S T U V W X

1 2 3 4 5 Y Z 6 7 8 9

a b c d e f g h i j k l m n

&

o p q r s t u v w x y z

FIG. 88.

and the proportions of letters to each other must also be considered in the composition of the design, as matters of the principal and subordinate parts of the same design, all of which will be more fully explained hereafter.

Elaboration of letters or the use of elaborate letters does not enhance either the beauty or the value of the design unless these letters are used intelligently, and a plain letter correctly and intelligently proportioned will produce a much more pleasing effect than the most elaborate style badly and ignorantly arranged.

ANTIQUE EGYPTIAN ALPHABET.

70. This letter, Fig. 36, is almost identical with the plain Egyptian, the distinction being in the addition of the spur at the angles of the letters, but no variation occurs in the proportion of the letter or its stroke. The **stroke** of a letter is the proportional width of its heavy lines in comparison with its height. In this letter the stroke is one-fifth the height, as shown by the small squares in which the letter surface is divided. Some designers make the spur much more exaggerated than is shown on this plate, while others make it scarcely perceptible. The examples given herewith, however, may be taken as an average, wherein the spur projects about one-third the width of the stroke. All letters having a horizontal stroke, as the *E*, *L*, etc., have these strokes finished with a beveled end, on which the spur is added at the same angle. The ends of the strokes of the *C* and the upper stroke of the *G* and *S*, and figures 2, 3, 5, 6, and 9 are beveled at an angle opposite to that of the other letters referred to above. This bevel, shown on the upper terminal of *C*, is made by drawing a line from a point one-fourth the width of the stroke to the right of *δa* to a point one-third the width of the stroke to the left of *δc*. The points *δa* and *δc* refer to the intersection of the fifth vertical line from the left side of the letter, with the third horizontal line marked *c*.

The middle bar of the *A* is the width of the stroke below

the center; the middle bar of the *H* is one-half the width of the stroke above the center; while the middle bars of the *E* and *F* are exactly in the center. The *J* is finished with a spur at *5e*, as well as just above *1e*. The points that determine the inclination of the strokes of the *K* are from *5a* to two-thirds the width of the stroke below *2d*, and from *4f* to the intersection of the upper slanting stroke with line *3* one-third the width of the stroke above *d*. The two slanting strokes of the *M* meet in the center of the letter at a point on line *f*, and no spurs exist on the insides of the slanting strokes at the top. The tail of the *Q* is cut on an angle of 45 degrees, the shorter side being the width of the stroke in length and the longer side being equal to the distance from *2e* to *3f*. The tail of the *R* is a slanting stroke; the points of contact are *4d* to *5f*. The strokes of the *W* come to a point on line *a* to correspond with the *M*. The corner of the *Z* is beveled off at about the same angle as the interior of the *5* and the top of the character *&*. The long slanting stroke of the character *&* is drawn from a point one-half the width of the stroke to the left and below *1a* to a point one-half the width of the stroke to the right of *4f*. The corresponding, or upper, slanting stroke, from its top to the beginning of the curve, is made from a point one-half the width of the stroke to the right and below *4a* to a point *2d*. The other slanting stroke intersects the long stroke the width of the stroke below this point and is parallel with the upper stroke, finishing on line *c*. The curve by which these strokes are united is three-fourths the width of the stroke to the left of line *1* at *e*. The middle bar of the numeral *3* is beveled at a slight angle, as shown. The character of the numeral *5* is changed at the point where the vertical stroke joins the curved bottom portion of the numeral *5*. The point added below the line *d* is necessary to fill out the space to the line of the curve. The numerals *6*, *8*, and *9* are about one-third the width of the stroke wider than the other characters, but are similar in other respects to the same numerals in the plain Egyptian alphabet.

The lower-case letters are, in many respects, the same as

those in the plain Egyptian alphabet, although many exceptions occur. All strokes extending above the line *a* are cut at an angle of 60 degrees, to which the spur is added at the same angle. This characteristic is also observable on letters of shorter height, such as the *i*, *j*, *m*, *n*, etc., but the ends of the strokes of all letters extending below the line are finished without this detail.

LIGHT ANTIQUE EGYPTIAN ALPHABET.

71. The difference between the alphabet shown in Fig. 37 and that shown in Fig. 36 is almost entirely in the weight of the stroke. The capital letters and figures of this alphabet are one-fourth higher than wide, with the exception of the letters *A*, *M*, *O*, *Q*, *S*, *W*, etc., which are wider than the others, and the letters *I*, *L*, and *N*, which are narrower.

On the top line we have, in *A*, a letter whose width is equal to its height, and in *I* a letter whose width is but three thirty-seconds its height. The cross-bar of the *A* is two and two-thirds strokes above the bottom line, and the curved line at the top and to the left of *A* is a short pen or brush stroke termed the cyma, on account of its resemblance to the curve of the Greek moldings of that name. The purpose of the cyma in lettering is to fill the space between the slanting parts of the letters, or extremities of letters where wide openings are likely to appear where the letters are placed together. It is also used as an integral part of some letters, as in the *Q* and lower part of the *Z*. In other styles of lettering the cyma is frequently used as a structural part of many letters, particularly in the Old English alphabet. On the letter *A* the cyma is eight strokes in length and is located one stroke to the left of the upper point of the *A*.

The letter *B* is fashioned so that its lower portion to the middle of bar is eight strokes above the bottom line, and projects one stroke to the right of the upper portion. As far as it goes, the letter *C* is a perfect arc of a circle, and the spur on the inside is about two strokes from the top line. The

ANTIQUE EGYPTIAN, (Light)

~A B C D E F G H I J K L
M N O P Q R S T U V W
1 2 3 4 5 · X Y Z · 6 7 8 9
a b c d e f g h i j k l m n o p q r s t u v w x y z

lower extremity of the letter projects a stroke beyond the top and finishes at a point about three strokes above the lower line. The right side of the letter *D* is semicircular and becomes tangent at the top and bottom three strokes to the right of the vertical. *E*, *F*, *G*, and *H* each possess a middle bar that is located four strokes below the top of the letter, and in the letters *E* and *F* this middle bar extends to within three strokes of the right extremity of the letter. In *K* the slanting stroke begins three strokes above the lower line and extends to the top line where the end is beveled at an angle of about sixty degrees. The letter *L* is about one stroke narrower than the other letters, and the cyma is placed over it so that its lower extremity is even with the right-hand portion of the letter. *M* is two strokes wider than the other letters, and in some cases is made precisely like an inverted *W*, except at the union of the two slanting strokes where the letter is finished flat with a spur instead of being pointed as in the *W*. Here the middle strokes of the *M* are brought to a point one-half the width of the letter below the top line. The slanting stroke of the *N* commences on the vertical stroke one-fourth the width of the letter below the bottom line. The loops of the *P* and *R* are very different in style, the middle bar of the *P* being four and two-thirds strokes from the bottom line, while the middle stroke of the *R* is six and two-thirds strokes above the bottom line. The tail of the *R* intersects the middle bar at a point where the curve becomes tangent. The letter *S* curves in each direction from a point in the center of the letter on a line with the middle bar of the *R*, and this letter is narrower at the top than at the bottom and can be enclosed in an isosceles triangle whose height is about three times the height of the letter. The *W* is precisely the same as two *V*'s joined at a point two and two-thirds strokes below the top line. The vertical stroke of the *Y* extends six and two-thirds strokes above the bottom line, the letter being twelve strokes wide on the top. The *X* is nine strokes wide on top and thirteen strokes wide on the bottom. The letter *Z* is the same width as the average letters on top, but it may

ANTIQUE EGYPTIAN^(HENRY)

A B C D E F G H I
J K L M N O P Q R
S T U V W X Y Z &
1 2 3 4 5 6 7 8 9

FIG. 88.

be finished either with the cyma as shown here, or with a bottom corresponding in detail to the top, as the fancy dictates.

The figures are of the average width of the letters, the *3* being similar to the *S*, and the *Z* to the *7*. The lower-case letters are easily constructed, as shown.

HEAVY ANTIQUE EGYPTIAN ALPHABET.

72. The style of letter shown in Fig. 38 is the heavy extreme of the Antique Egyptian style, in the same manner that Fig. 37 was the light extreme of this style. Between these two extremes the style may be varied to almost any extent, slight variations in the form of letter being necessary to suit the different conditions. The Heavy Antique Egyptian, however, is rarely used as a solid black letter as shown in this figure, and is only so printed here in order to preserve uniformity in the alphabets.

In much design work this letter is found in simple outline, and though extremely bulky on account of the weight of its stroke, it may be gracefully handled and elaborately ornamented to produce a most pleasing effect. The stroke in the Antique Egyptian alphabet should not exceed one-third the full width of the average letter, which is the extreme illustrated in this case, and it will be observed that with this heavy stroke it is necessary that certain letters, such as the *K*, *S*, *V*, *W*, etc., be carried beyond the limiting top and bottom lines, in order that the full outline of the letter may be shown without confusion of parts. In some places, too, it will be found necessary to diminish the width of the stroke in order to leave necessary space between strokes, and other variations may be indulged to suit specific circumstances.

MEDIEVAL ROMAN ALPHABET.

73. This style of letter, by many authorities, is termed the Antique Roman, but it belongs to the historic period indicated by its name. The Medieval Roman alphabet as

MEDIEVAL ROMAN

A B C D E F G H I
J K L M N O P Q R
S T U V W X Y Z &
1 2 3 4 5 6 7 8 9

shown in Fig. 39 possesses three distinct and characteristic features. First, there is a small spur that projects above and below the lettering lines, and there is another projection of the inside line of the stroke beyond the fine line for a distance of about one-third the stroke, as in the top of the letter *A* and the bottom of the letter *N*; and besides these, every angle between a stroke and a fine line is rounded. The width of the stroke here is from one-fourth to one-fifth the height of the letter, and the spur is one stroke long and is joined to the letter one stroke above the bottom, or below the top line, thus making the curve on the inside an exact quarter circle.

All letters average five strokes in width, with the exception of such letters as have heretofore been described as varying from the regular limits. In the letter *A* the fine line intersects the stroke at the point of the letter, and though on its inside the stroke is carried past the fine line, the intersection takes place precisely as though this peculiarity did not exist. The horizontal fine line of the *A* is one and one-fourth strokes above the bottom of the letter.

LIGHT AND HEAVY FRENCH ROMAN ALPHABET.

74. In modern usage the Roman alphabet is varied somewhat to suit certain purposes. One of these variations, called the "New York Roman," adheres in outline very closely to the original Medieval form with the exception of the projecting spur of the stroke beyond the fine line. Another variation, known as the "French Roman," differs from its prototype by increasing the weight of the fine line in order that it may be better expressed in carved stonework, etc. The variations of these three styles, from an extremely light letter to an extremely heavy letter, is practiced by all designers, but the similarity is such that we only give the normal conditions of the Medieval Roman and extreme conditions of the French.

In Fig. 40 is shown the Light French Roman alphabet,

FRENCH ROMAN^(light)

A B C D E F G H I
J K L M N O P Q R
S T U V W X Y Z &
1 2 3 4 5 6 7 8 9

FIG. 40.

·FRENCH·ROMAN: (HENRY)

A B C D E F G
H I J K L M N
O P Q R S T U
V W X Y Z &

FIG. 41.



FIG. 42

and this fills the same position in the variation of the alphabet as the Light Antique Egyptian. In giving the letter weight, as shown in Fig. 41, certain liberties are taken with the fine lines, as shown in the lower strokes of the *E*, *L*, and *Z*.

In using these Roman alphabets, care must be taken to have the lower-case letters well proportioned in the weights of their strokes with the capitals that are used. In Fig. 42 are shown the lower-case letters of the French Roman and the Medieval Roman alphabets, the former, it will be observed, possessing a much heavier stroke. These lower-case letters in Fig. 42 are proportioned for the normal condition

of alphabet, and where used with the heavy or light alphabet, they must be increased or diminished in stroke accordingly. The use of the Roman numerals with these alphabets is by no means essential, but the numerals are given here in order that the proportionate stroke may be observed. There are many cases where the use of the Medieval Roman alphabet is appropriate beyond all other alphabets, and it is usual that in such cases the Roman numerals be used.

GOthic ALPHABET.

75. The style of letter we term "Gothic" was designed during the latter part of the Medieval period and is associated both historically and architecturally with the style of Gothic architecture that existed during the Flamboyant period in France and the Perpendicular period in England. In modern use this letter is largely applied to church decoration for the purpose of making religious quotations, and is also used in printing for certain kinds of literature on account of its origin in ancient monasteries. It is similar but much more easily read than what we term "Church Text," and is, therefore, given here to the exclusion of the latter, as it is much more serviceable.

In Fig. 43 the capital and lower-case letters, as well as the figures, are shown, and the distinguishing characteristics of this style lie in the peculiar formation of the letters *A*, *C*, *E*, *F*, *H*, *J*, and *U*. The letters *A*, *M*, *N*, etc. do not possess any slanting strokes as they do in the Roman alphabets, but are formed with a vertical stroke as one of their sides and curved strokes for the rest of the outline. The letters *C* and *E* are closed on their right sides by a vertical line ending in small dots or volutes, the line on *E* being longer than that on the *C*. The *F* is similar in general outline to the capital *F* of the Roman styles, but carries its spur on the upper fine line below the bottom of the letter itself. The capital *H* is but slightly varied from the lower-case *h*, and the *J* is peculiar in its general details to

✠ Gothic ✠

A B C D E F G H I Y
K L M N O P Q R S T
U V W X Y Z

1 2 3 4 5 6 7 8 9 0

a b c d e f g h i j k l m n o p q r s t u v w x y z

18TH CENTURY

A B C D E F G

H I J K L M

N O P Q R S T

U V W X Y Z

FIG. 44

HENRY VII
(WESTMINSTER ABBEY)

A B C D E F G H

I J K L M

N O P Q R S T U

V W X Y Z

this style of alphabet. Other details of peculiarity exhibit themselves to the student as he studies this style. This letter is frequently elaborated in certificate and engrossing work, by means of shading and elaborate backgrounds, and some proportions of the letters may be slightly changed in order to suit them to particular circumstances.

A later development of this alphabet is shown in Fig. 44, where the letters *A*, *M*, *N*, etc. partake of the same characteristics as the Roman letter, while the peculiar ogival form of outline characteristic of the Gothic style is maintained in all of the curves in the stroke. A strong characteristic difference, however, between the alphabet in Fig. 43 and that in Fig. 44 is that in the former all the fine lines are straight and in the latter all of the fine lines are curved, except in the *A*, *K*, *M*, etc. This style of letter, usually termed "16th Century," is suitable where more elaboration is required than the Gothic style permits, and is seldom used for church work as it is associated with that period of architecture when the building of churches was in its decline.

Another style of letter that had its origin, also, in the Gothic is illustrated in Fig. 45 and is termed "Henry VII" inasmuch as the only existing example of this work is to be seen in the Henry VII Chapel at Westminster Abbey. As a matter of fact, this is technically a Renaissance style, although like all early Renaissance art it developed from the Gothic. The tendency to elaboration and the introduction of meaningless curves and forms is characteristic of this period, but the style of alphabet when properly treated affords a very valuable means of enriching a design that is composed almost entirely of lettering work.

OLD ENGLISH ALPHABET.

76. A standard alphabet that has ever been popular and is ever serviceable under certain conditions is the Old English, shown in Fig. 46. There can be little doubt that this bears a close relation to the Gothic alphabet, and,

Old English

A B C D E F G H I J K
L M N O P Q R S T U V
X Y Z

a b c d e f g h i j k l m n o p q r s
t u v w x y z

indeed, its lower-case letters are very similar to the Gothic; and, though it is much used in church work and in the designing of certificates and other engrossed documents, it is not as legible as the Gothic alphabet and is more suitable for conditions where ornamentation is required rather than clear information.

It will be observed in this alphabet that the cyma forms a marked characteristic in each of the letters. For instance, in the letter *E* nearly all the strokes are composed of at least a portion of the cyma. Certain letters are very hard to distinguish from one another in this alphabet, and care should be taken to remember the distinguishing characteristics of each in order that they may be rendered without referring constantly to the copy. In some forms of alphabet, the *C* and the *E* are almost identical, the exception between the two letters being that the *E* contains a solid stroke where the two horizontal fine lines exist in the *C*. We think it preferable, however, to use the form of *E* shown in Fig. 46, although this is somewhat confusing when compared with the *F*. It will be observed that the vertical stroke of the *F* is a straight stroke and not a cyma as in the *E*, and that a fine line connecting the upper spur of the *F* with the main stroke is straight instead of a curved continuation of a cyma as in the letter *E*. *T* and *U* are also difficult to distinguish in some styles of alphabet, and study should be given to the formation of the *I* and *J* in order that they may not become confusing.

A little consideration of these letters will show the student that there are only three or four different styles of stroke and that many different letters are formed simply by the addition of some detail of other letters. For instance, the letter *E* differs but slightly from the letter *L*, except in the addition of its center spur, and the left-hand portion of the letter *M* is almost identical with the letter *I*. Similar resemblances will be found in many other letters, such as the *Q*, *R*, etc., and the *Z*, though shown on this plate with a compound final stroke, is often drawn with a top and bottom of the same character.

The lower-case letters are similar to the lower-case letters of the Gothic alphabet, except that they are somewhat heavier in their stroke, but for all practical purposes the two styles are so near alike in their lower case that one is frequently used with the other without invoking any severe criticism.

77. In making use of these alphabets in design, it has been customary to associate all the Roman styles with Classic and Renaissance art and to use the Gothic and "16th Century" with Medieval art; while the Henry VII and Old English are used both in Medieval and Renaissance art. There are cases where one style of letter may be used perfectly proper in another style of art, but care must be given to this consideration when the mixture of styles is attempted, as it will readily be seen that there is nothing particularly incongruous about using the Roman letter in Renaissance art, or even in Gothic art, but a Gothic letter would be highly out of place in Classic art no matter what were the circumstances. The reason for this should be clear, as the Gothic architect might have inherited some knowledge of the Roman letter and used it in his designs, but it would be utterly impossible for the Roman designer to borrow a letter of the Gothic style inasmuch as that letter had not been invented during the period of the Roman architectural styles.

78. The initial letters that are woven in many of the designs of French Renaissance art usually tend toward the character of the French Roman, and the interwoven initials of H and C in the wall decoration shown in Fig. 32 are borrowed from the style we have herein described as French Roman, and comparison of other initials that will be found carved in the stonework of the mantels illustrated in the foregoing pages will indicate that they have all been adapted to their modern purpose from the more ancient style of classic letter.

ELEMENTS OF ORNAMENT.

COMPOSITION.

1. Unity in Design.—Composition in art deals almost entirely with the grouping of the elements of a design to bring them together and appear as a **unity**. No matter of how many parts a design may be composed, if these parts are properly treated, it will present to the eye an appearance of unity and individuality, and only in such periods of art history as the designs have presented this unity do we find a progress in a thoroughly artistic sense.

To illustrate this some-

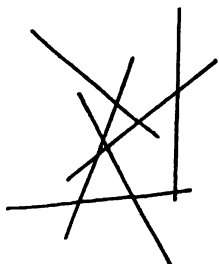


FIG. 1.

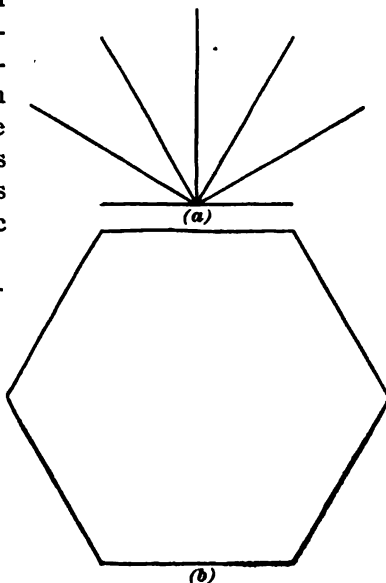


FIG. 2.

what, we have, in Fig. 1, a group of six lines, all of one length, but irregularly arranged. There is no expression

of unity in this, nor is there anything about it suggestive of an attempt at any kind of an arrangement, but in Fig. 2 these same six lines are so placed as to convey an idea beyond the lines themselves, and the individual lines are lost in the expression of unity. Another method of producing this impression is to surround the irregularly drawn

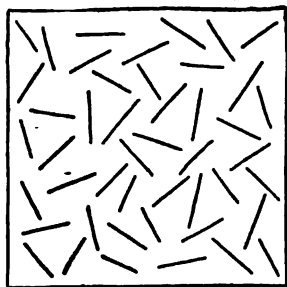


FIG. 2.

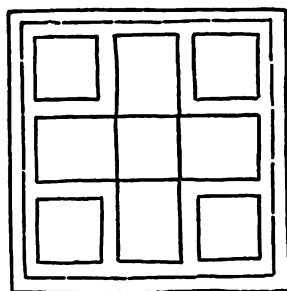


FIG. 4.

lines with some detail of more importance, as shown in Fig. 3, where a number of irregular lines are included within a rectangle and the force of the outline is sufficient to combine all the lines in one idea. Again, the smaller lines may be grouped to form a series of geometrical figures within a similar geometrical figure, and produce this same feeling, as shown in Fig. 4.

2. Limit of Outline.—In order to express this feeling of unity, there must be a *limit* in the outline governing the arrangement of the lines; for instance, in Fig. 5 we have a



FIG. 5.

series of equal lines arranged in groups that repeat indefinitely; but there is nothing to stop them and there is a feeling of continuity as though it might be extended forever in the same arrangement without materially changing the form. This feeling is not unity, but *continuity*, of which we shall

have occasion to speak later. In Fig. 2, the arrangement of the six lines, in one case, conveys an impression of extension, as though it could be extended in any direction and in all directions without impairing the original form—this is continuity in all directions. The other geometrical form in Fig. 2 conveys the idea of unity and contraction without any impression of a desire to spread out.

3. Assemblage of Details to Secure Unity.—In assembling the subordinate details of a design in order to secure a unity in the whole, there are three general arrangements or groupings that completely satisfy the mind to a sense of unity: One single object always looks well alone, unless improperly subdivided or surrounded by a lot of trivial and discordant details. An arrangement consisting of a group of two things can be made to look well, unless there is too great a difference in their form or size, or unless they are badly united. Any group of three things looks well, unless they are of uniform size or consist of too prominent a character to be expressed in any quantity at all.

SURFACE DECORATION.

4. Subdivision of Space.—Surface decoration consists in the subdivision of a given space so that its parts shall bear a relation to one another that varies in form and shade. This subdivision may be accomplished by the judicious spacing of a number of straight lines so that the separated members bear a definite relation to one another. Take, for instance, the square; its proportions cannot in any way be varied, as all its sides are equal; but its surface may be divided into a number of smaller squares, as shown in Fig. 6,

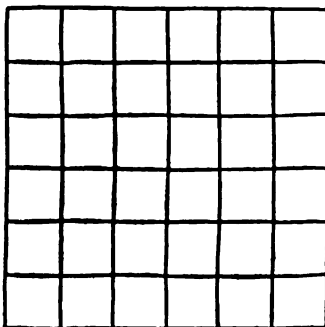


FIG. 6.

simply by the placing of equally spaced vertical and horizontal lines. This, however, does not accord with our idea of unity, because, if it expressed unity, we should feel that nothing could be taken away from the square without destroying its value, and, in Fig. 6, should we take away eleven of the smaller squares across the top and one side, we would still have a square very little different from the first one.

5. Arrangement of Lines.—Suppose we divide the surface of the square somewhat as shown in Fig. 7, spacing the dividing lines more irregularly and grouping the lines themselves in pairs and singly. This relieves the surface of its monotony, and the various parts bear definite relations

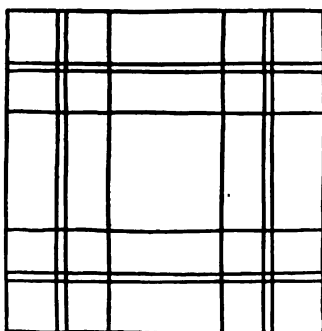


FIG. 7.

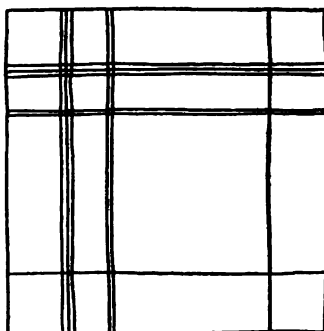


FIG. 8.

to one another, so that the surface appears as a unit, the subtraction of any member of which would materially change its appearance. In Fig. 8 we have another subdivision of the surface of the square where the lines are not symmetrical on all four sides, and yet this is relieved of that feeling of monotony so dominant in Fig. 6.

An immense variation of surface can thus be accomplished simply by the placing of lines, and the more irregular the intervals between the lines, the greater scope is there for invention and design, as there is no limit to the number of different arrangements that can be arrived at in the division of a space in this manner. The symmetrical arrangement in

Fig. 7 is the character of subdivision we must adhere to in the design of ceilings, paneled wainscots, and the like, while the unsymmetrical design shown in Fig. 8 is characteristic of woven fabrics such as plaids and other dress goods.

6. In order to fully comprehend the importance of this simple suggestion, the student should make a freehand drawing of a simple square measuring about 4 inches on each side, and divide it by vertical and horizontal lines into various relative shapes. A piece of tracing paper laid over the square, so as to retrace its outline, may be used to advantage, and a traced square made in this way may be divided into a number of pleasing forms that may afterwards

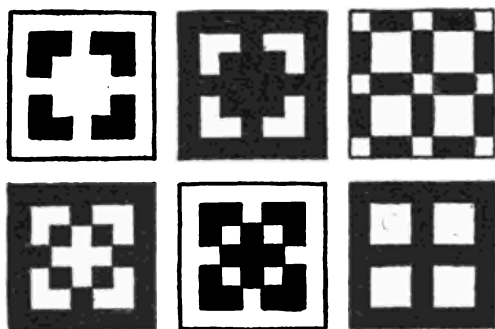


FIG. 9.

be compared to determine which of the arrangements are more satisfactory to the eye than others. When this has been determined, endeavor to ascertain what arrangement of lines satisfies the eye most, and what arrangement satisfies it least. Some arrangements will always be more interesting than others, and a little study will show that the most satisfactory groupings are dependent entirely on the variation in the proportions and relations of their parts. Take, for instance, Fig. 9, wherein we have six different arrangements on precisely the same grouping of lines, the relative parts of this being produced by shade and not by line grouping,

as in the previous example. But in Fig. 10 we have four examples of a surface divided by lines the grouping of which makes four distinct figures entirely different, some of which

are more pleasing than the others.

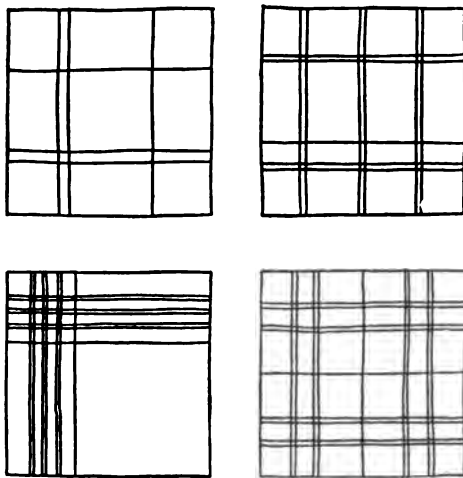


FIG. 10.

7. Study of Grouping.—In this grouping of lines it is important that the student should study various works of art. He will soon learn that certain things look well if grouped in a certain manner, no matter whether they are the figures in an oil painting, lines in a plaid, the

windows of a building, or the leaves of a plant as they are disposed in a carved panel; and he should study as much as possible those forms of art that have been handed down from generation to generation throughout history as being beautiful and worthy of attention. In the French châteaux we have an elaborate grouping of chimneys and turrets; in fact, the distinguishing characteristic of these buildings lies in the grouping of their roof treatment. In the Venetian palaces we have a variety of relations of lines and spaces in the arrangement of the windows in their facades, and in Arabian and Moorish art we find the surface decoration grouped on geometrical principles wherein the proportion of one part to another is affected not only by lines, but by color systematically and scientifically applied. The student should therefore, in studying the simple outline forms in Figs. 6 to 10, bear in mind that, simple though they be, the principle of their pleasing or unpleasing appearance is the same that governs the most elaborate ornament

in the Venetian style or the most brilliant coloring in Moorish art.

8. Relation of Colors.—In the coloring of parts we do not really consider the actual spectrum shades that exist on adjacent members of a design, but rather the tints or shades as they appear to the eye. A design may be expressed in two tints or it may be expressed in more, and the depths of these tints should bear a definite relation to one another in proportion to the surface that is covered. We know that the three primary colors—yellow, red, and blue—exist in their pure form in perfect harmony in the proportion of 3, 5, and 8, and the same may be said of black-and-white compositions. A certain depth of one shade must be in exact proportion to a lighter or darker shade, in order that a feeling of harmony may exist in the composition. In all examples of ancient art we find that attention has been given not only to the exact subdivision of a surface in order that the space relations may be pleasing, but that the most careful consideration has been given to the coloring of each of these divisions and its appearance and relation beside the coloring of its neighbors. This color relation can exist in line composition where the lines used are of different breadths, or weights, thereby bringing somewhat the effect of a surface element in their appearance.

9. Light and Shade.—We find in certain oriental designs for rugs a thorough understanding of this relation of **light** and **shade**, and to it we are indebted largely to the influence of Mohammedan religion on oriental art. As the creed of Mohammed forbade the representation of any natural form, it became necessary for his followers to secure pleasing effects in their designs by color relation or light and shade, and thus freed from the struggle to imitate nature, their whole attention could be concentrated on this other element.

10. Reversion of Colors.—In Fig. 11 is shown a design for a rug, based on the simplest geometrical lines, while in Fig. 12 the same identical pattern is produced, but

reversed so far as its color relations are concerned. It is at once evident that any design consisting of but two tones is



FIG. 11.

susceptible to this reversing of its treatment in color relations, and parts of it also can in some cases be reversed, while others remain the same. For instance, in Fig. 11 we have a rug with a dark center on which the geometrical ornament is traced in light lines, while the border is of a light shade and the geometrical ornament is traced in dark lines. In Fig. 12 we have exactly the reversal of this—a light center and a dark border.

Put the border of Fig. 12 on Fig. 11 and we have a dark rug throughout, the geometrical ornament of which is executed in light lines; reverse this new pattern, and we have what would be the equivalent of Fig. 12 with the border of Fig. 11. In this way a number of different arrangements in light-and-shade effects can be made with the same geometrical design as its foundation. In fact, many grades of rugs and carpets are woven so that one side presents one effect and the other exactly its reverse in light and shade.



FIG. 12.

11. Reversion of Treatment.—In Fig. 13 are shown four styles of ornamentation, each of which is expressive of unity and balance in its

design, but each at the same time being perfectly capable of a reversal in treatment in three or more ways. For instance,



FIG. 18.

in any example the border can consist of black figures on a white ground and the center of white figures on a black ground, or the border and center can both consist of white

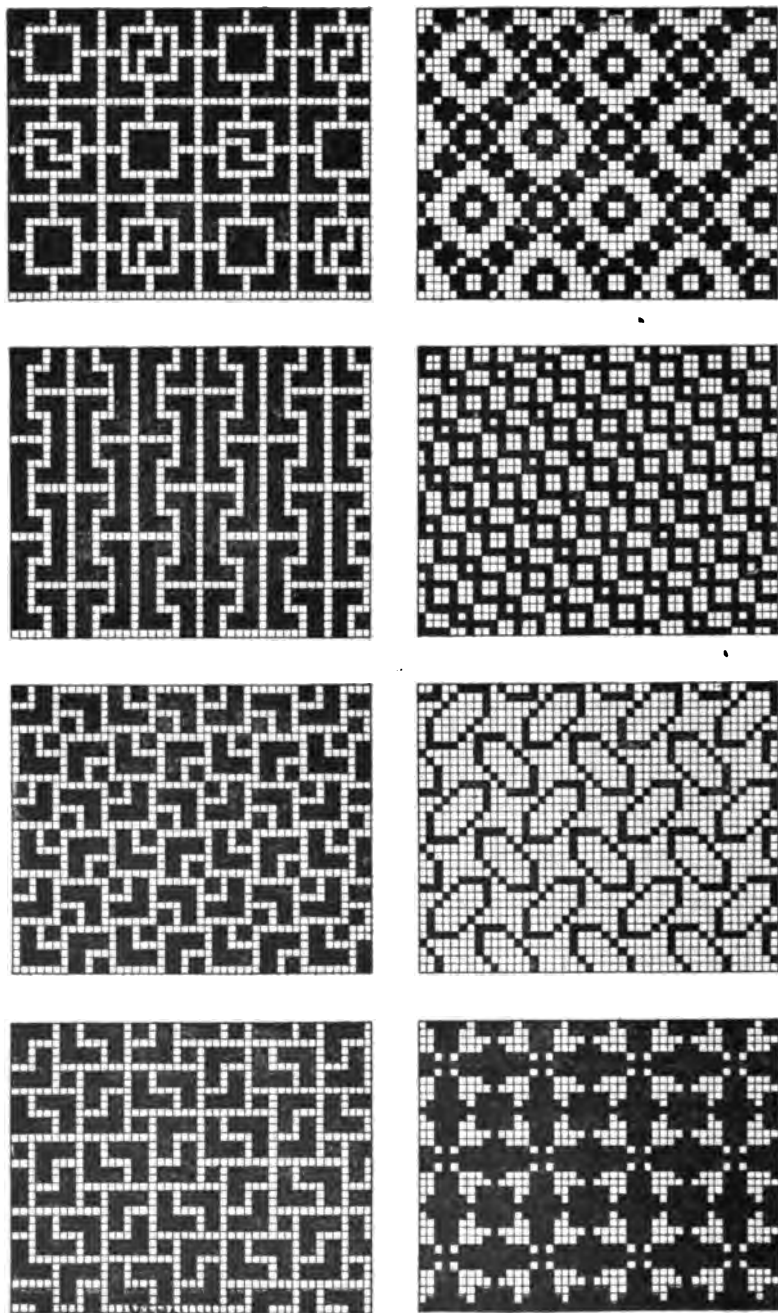


FIG. 14.

figures on a black ground, or a third arrangement will permit of a reversal of the first; certain figures can be changed and others remain the same, thus giving a great variety.

The proper understanding and comprehension of this color relation in surface decoration enables the student to produce an almost unlimited variety of effects, as is shown in Fig. 14. Here we have eight examples of variation in light and shade, all based on precisely the same geometrical arrangement, the entire variation being produced simply by a variation in the relation and proportion of the effects of light and shade. The frequent practice of rendering in this manner is of immense value to the designer. Let him divide a surface up into a number of small rectangles and then work over them with a brush charged with heavy color, and group these rectangles so as to produce different symmetrical designs, in order that he may familiarize himself with the capability of these forms for extension and comprehend the value of a thorough understanding of this principle.

12. Variety of Designs from Same Elements.

Referring to Fig. 14, the eight examples there shown are executed in but two colors—black and white—and all based on a uniform arrangement of lines that divide the surface originally into a number of small squares. Turn this principle over to immediate practical work, and we find that, in laying a tile or mosaic floor, any one of these designs could be produced with a series of tiles or mosaics cut to uniform squares representing each of the squares divided in our surface design, and colored in proportion to the light and shade of our example.

In wood mosaic or parquetry work, a number of simple squares or a combination of squares and rectangles of uniform sizes in light and dark woods would produce any of these eight patterns and many more. The arrangement of the geometrical constructive principle of diagonally intersecting lines so as to produce the triangle, the lozenge shape, or the hexagon, brings us again in contact with other systems of construction in which the variety is also unlimited.

CONVENTIONALISM.

13. Necessity of Conventionalism.—**Conventionalism** of design is usually very much misunderstood by students in art, and the majority are inclined to believe that it is simply a term that means stiffness and rigid formality in a design. This is entirely wrong. A conventional treatment may be easy and flowing as well as severe, both qualities being necessary and valuable in their proper places, but by no means is either one of them absolutely necessary at all times.

As an illustration, take a piece of pottery or a china plate, and the design executed on it represents a spray of flowers. While it is proper that the designer should go to nature and draw his instructions from natural forms in order to create decorative design, there is a limit to which he can carry this imitation justifiably, and it is in this spray of flowers where that limit shall be expressed.

14. Shall the imitation be a portrait of the flower spray, showing the light and shade, and the shine of the leaves, and all the details connected with the appearance of that spray under particular conditions of surrounding and lighting? Or, shall it represent the spray regardless of light and shade, so that, no matter under what conditions the plate or pottery appears, its decoration will always seem to be in place? A plate is a movable object, and its decoration is seldom seen in the same position twice in succession. Therefore, a painted spray on this plate, that demanded a certain condition of light in order that it should appear to its best advantage, would be entirely out of place, while one with the light and shade ignored, all the refinements of form still retained, and all the delicate details of nature emphasized, would certainly be most suitable.

In the naturalistic treatment, the beautiful and delicate details of nature are lost in the attempt to make the spray seem natural, and, in making it natural—contrary as it may seem—we make it false.

15. Invention and Imitation.—Decorative art originates in two distinct faculties of the mind—the **inventive**, or constructive, and the **imitative**. Inventive ornament consists of an arbitrary and abstract arrangement of lines calculated to produce a pleasing effect. This is characteristic of the savage tribes, though traces of it pervaded all the great styles, the frets and interlacings of the Classic, Medieval, and Arabian styles being of this character. Inventive ornament of this class affords the best practice to the student in the study of decorative design, and, at the same time, offers the best and simplest means of demonstrating some of the greatest principles of ornament.

16. The Oval in Nature.—There is an abstract form that seems to pervade many beautiful forms in nature; this form we call the **oval**, and on it are based many outlines seen in the vegetable world. It is an elementary outline of many leaves, and also enters into the composition of the human head and hand.

In studying the oval we find that its two sides are alike, that is, it is repeated on each side of a center line. It is not only repeated, but, being reversed, one side is contrasted to another, and still, again, throughout the entire curve—unlike the curve of a circle—there is a constant change of form and direction; therefore, we have a variety. Hence, three important principles of design—*repetition*, *contrast*, and *variety*—are expressed in the simple form of this oval.

17. Repetition, Contrast, and Variety.—Now let us take up these three principles in a point of design. The simplest arrangement of lines in order to secure repetition is somewhat shown at (a) in Fig. 15, but here there is no variety; while at (b) we secure variety with the same arrangement for repetition by making the lines of varying lengths, but there is no contrast. Let us again change them and put them as we have them at (c), which gives us contrast, but destroys our variety. However, by adopting the

three methods in (a), (b), and (c), we have in (d), **repetition**, **variety**, and **contrast**—the three elements that we seek.

Abandoning lines, let us return to some natural form. In

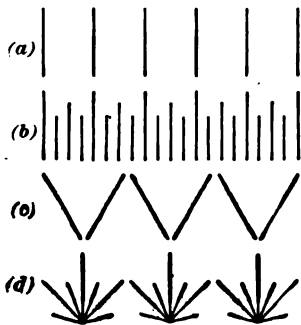


FIG. 15.

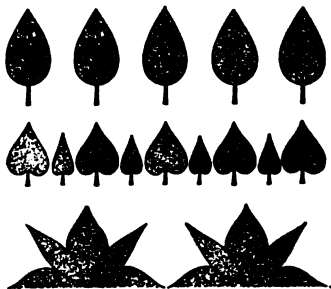


FIG. 16.

Fig. 16, at (a), we have repetition, at (b), we have variety, and at (c), by combining (a) and (b), introducing the third element as in the previous case, we have repetition, variety, and contrast in leaf forms as desired.

18. Symmetry and Radiation.—In addition to these principles, we have evolved two more, so far unspoken of, as shown at (b) and (d) in Fig. 15. These principles are,

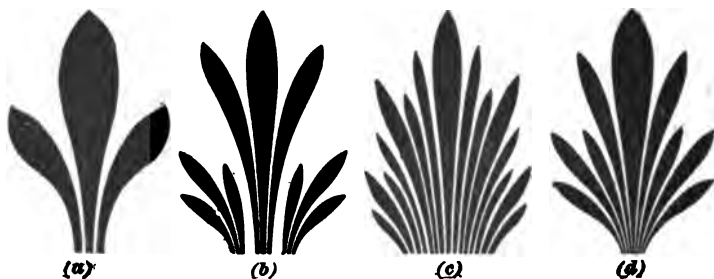


FIG. 17.

symmetry and radiation. Symmetry has many forms of expression, but usually may be considered to mean *likesidedness*, no matter what the form of the object may be. At (a),

Fig. 17, is shown a form of symmetry that consists simply of the arrangement and repetition of a given form each side of a center line; this is known as *bisymmetry*. At (b) is a similar arrangement where the forms on the sides are the same in detail as the form that separates them; this is known as *trisymmetry*. At (c), where there are a number of forms each side of a similar form in the center, we have what is known as *multisymmetry*.

By bringing the forms shown at (b), Fig. 17, together to form a unity, we have an example of radiation from a point, as shown at (d'), while the distribution of the forms along a center line, as shown in Fig. 18, gives an example of radiation from a center line.



FIG. 18.

ORNAMENT.

LINEAR ORNAMENT.

19. Ancient Pottery Decoration.—From a consideration of the earliest forms of historic art, it will be found that, after the most suitable form of utensil for the purpose required had been arrived at, the easiest and readiest means were employed to execute the decoration of its surface. The elements of the pattern were of the simplest character—composed of straight lines—and a pointed stick was generally used to execute the ornament in the soft clay of their pottery.

Fig. 19 shows a vase where the straight lines variously arranged in patterns are disposed in bands, and the patterns are a result of simple arrangement in accordance with some fundamental principle handed down from generation to generation. Pottery is selected for the demonstration of

this point; inasmuch as it is of a more durable character, we have more examples of the early period, and it therefore furnishes a more reliable series of art development.



FIG. 19.

It has often been demonstrated that the patterns evolved by weaving are identical with, and often suggested by, the patterns found on pottery. It is only incidental to point out in this figure that there appears to be an unconscious obedience to the laws of fitness in the application of these straight-line patterns. They are not applied in an arbitrary way, but in harmony with the structure they adorn.

20. Fitness of Ornament.—As a usual thing, the rim comes in for decoration in order to give the part most likely to fracture an appearance of strength, while any change in the contour of the form is usually emphasized by additional ornamentation. The reason for this may be found in the fact that the application of ornament gives an impression of strength, and, when a vase or jug in its plastic condition is difficult to maintain in shape, the idea naturally suggests itself to the potter to decorate that part that exhibits the weakness of the form. This determines largely the location of the bands around the curves. We will find also a precedent for this in the vegetable world, as changes in the directions of stems are generally accented in some way or other by the thickening or broadening of the point of union for the two elements. The stem of a leaf is usually almost as large or thick as the branch itself at that point.

21. As we progress in the study of prehistoric decoration, the later examples possess the curved line, and the zigzag—so common in early work—becomes softened and gradually develops itself into a wavy scroll, as shown at

(a), (b), and (c) in Fig. 20. The changes arise from the fact that the angles are first rounded off, and the other portions of the line between the curves are softened and graduated until the zigzag loses its identity entirely in the wavy line at (c).

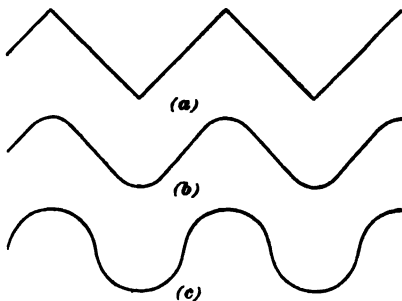


FIG. 20.

22. Constructive Origin of Decorative Art.

—From these illustrations it will be readily understood that decorative art had a constructive origin. Primitive man, finding it necessary

to provide coverings for his body, learned that the weaving of certain strands produced certain patterns, such as the zigzag, lozenge, etc., and in later periods, when he had learned the use of metals, he applied the forms thus associated in his mind. These forms were again adopted in decorating other materials, and hence formed a starting point for decoration.

23. Evolution of Design.—If the student will now follow out graphically the progress of design from the work of the savage to that of civilized man, he will comprehend a number of details that he otherwise could not learn.

On a sheet of paper, rule off a number of equally spaced vertical and horizontal lines, as shown in Fig. 21. Then emphasize certain lines of the square meshes, but varying the emphasis by shade work or spotting to produce different patterns all based on the same geometrical principle as shown at (a), (b), (c), and (d). (a) is the simplest form, and consists of repeated crosses alternating with squares, while (b) is evolved on the same principle, but by uniting the intermediate squares with the crosses; (c) is another pattern resulting from the inclusion of a greater number of foundation squares, and (d) shows how an interlaced design may be produced. The geometrical figures at (e) contain

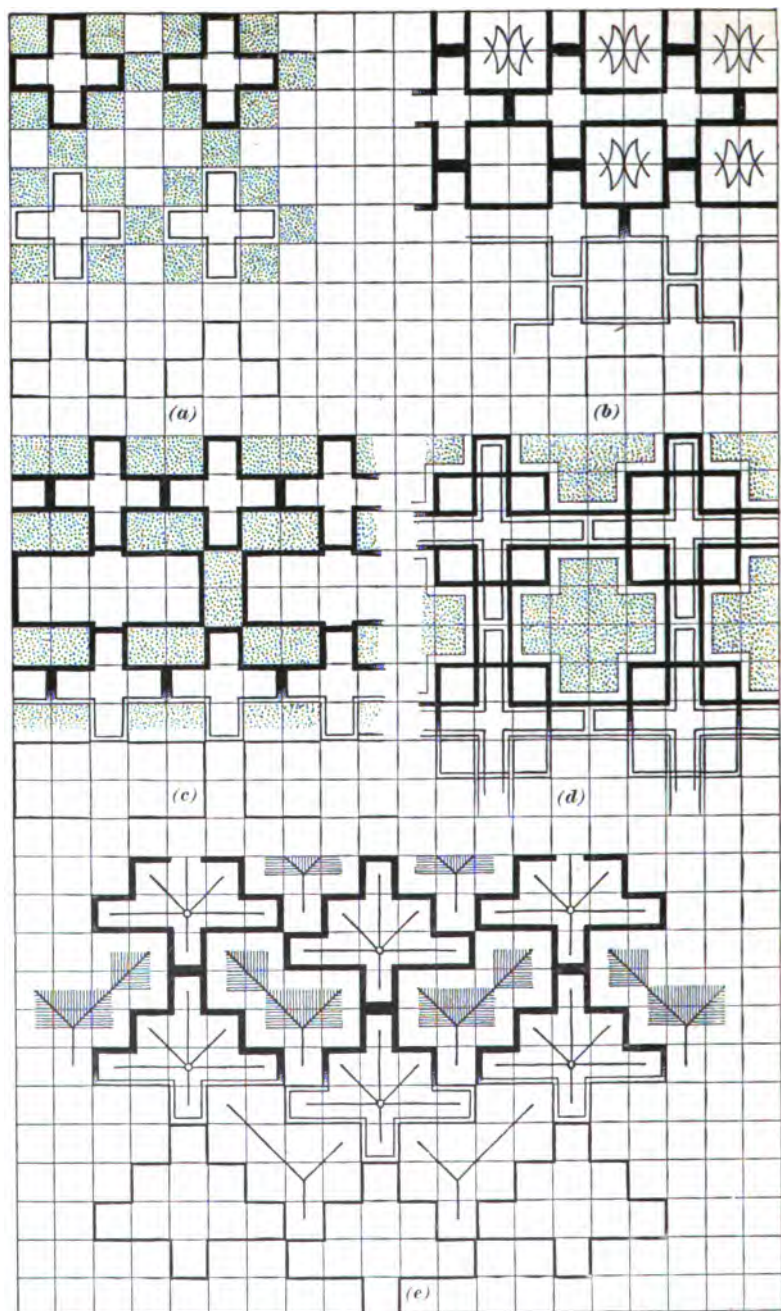


FIG. 21.

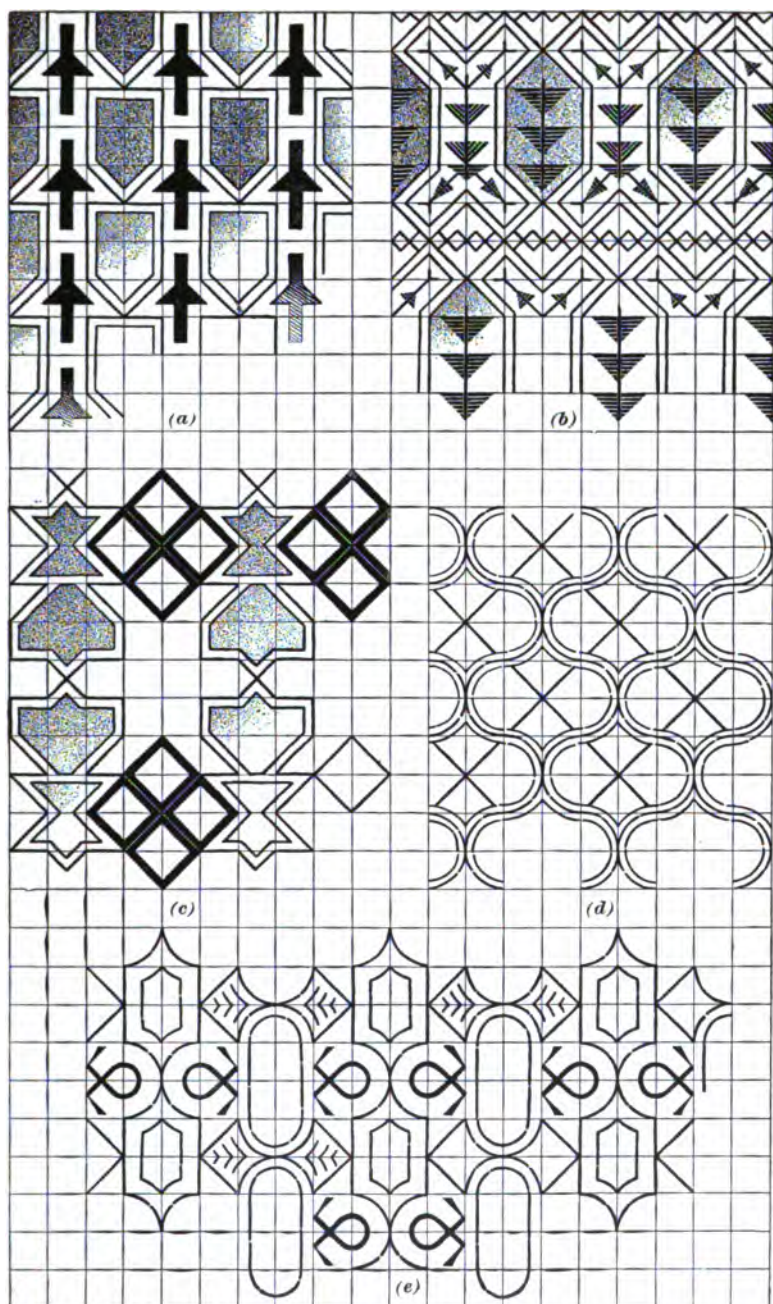


FIG. 22.

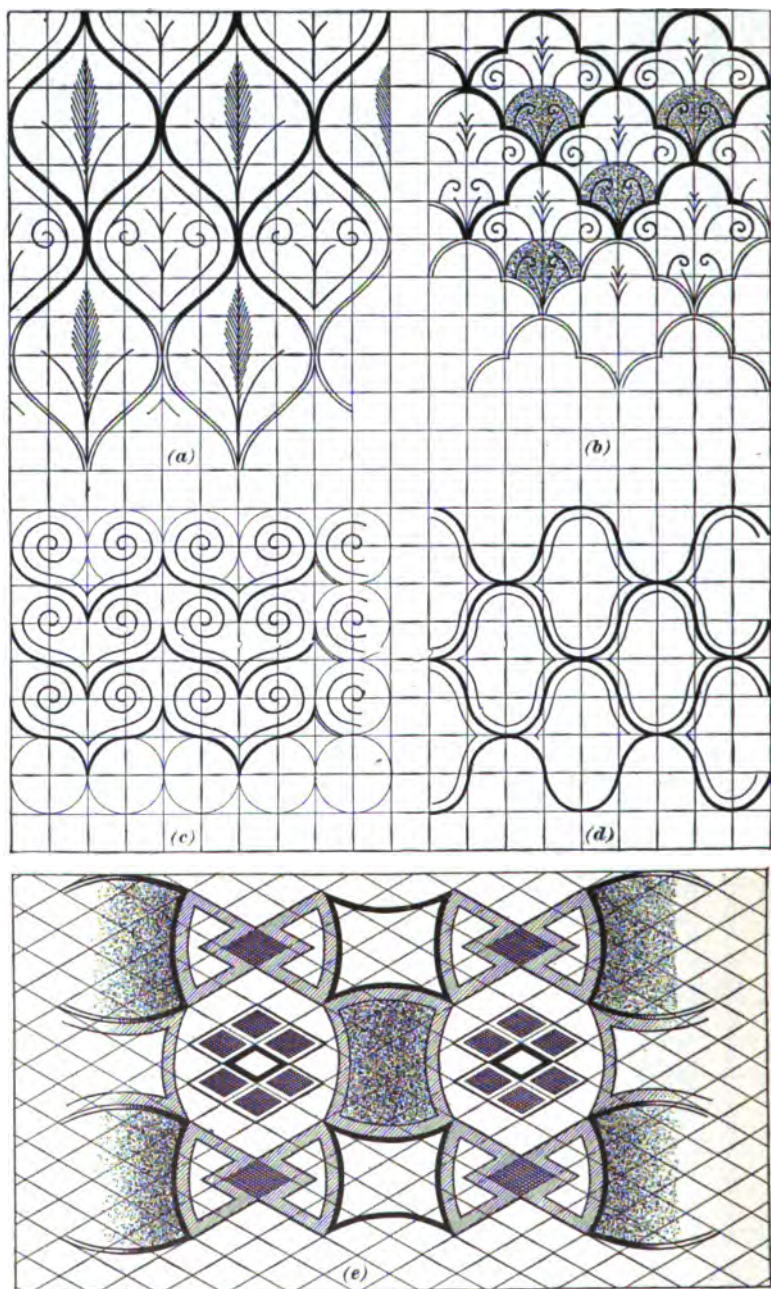


FIG. 23.

elements of more progressive design, and resemble the patterns usually evolved by the savage race.

In Fig. 22 is shown a different series of patterns evolved by working on the diagonals of the squares and then by the introduction of semicircles struck from the angles or intersections of the diagonals.

24. Limitless Variety of Patterns.—The product of various patterns on this plan is almost unlimited, a few of which are shown in Fig. 23 in order that the student may better understand the extent to which this can be carried. At (a), Fig. 23, quarter circles are struck from the center of each figure, thereby forming a series of wavy lines that determine the shape of the pattern. At (b), however, a series of semicircles is emphasized so as to generate a trefoil pattern, while (c) and (d) are produced by means of a number of tangent circular arcs, and (e) is developed upon lines crossing one another diagonally so as to leave lozenge shaped spaces instead of squares or parallelograms.

In the latter case we have a series of figures produced somewhat as shown in Fig. 24, each of which can be used as

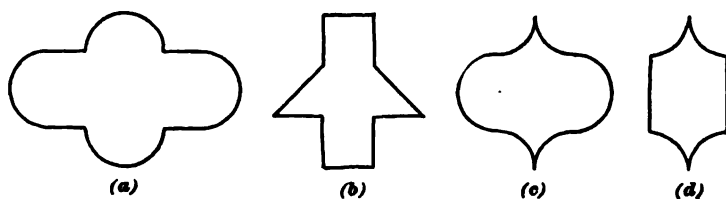


FIG. 24.

the element for the construction of a new pattern, as shown in Fig. 25. If, now, we reduce the forms shown in Fig. 24 to their own individual elements, we get a series of forms similar to Fig. 26, and, applying these as elements of design, produce results similar to Fig. 27, where at (a) we have an orderly arrangement of the obtuse angle shown at (a) in Fig. 26, at (b) a combination of the quadrants shown at (b)

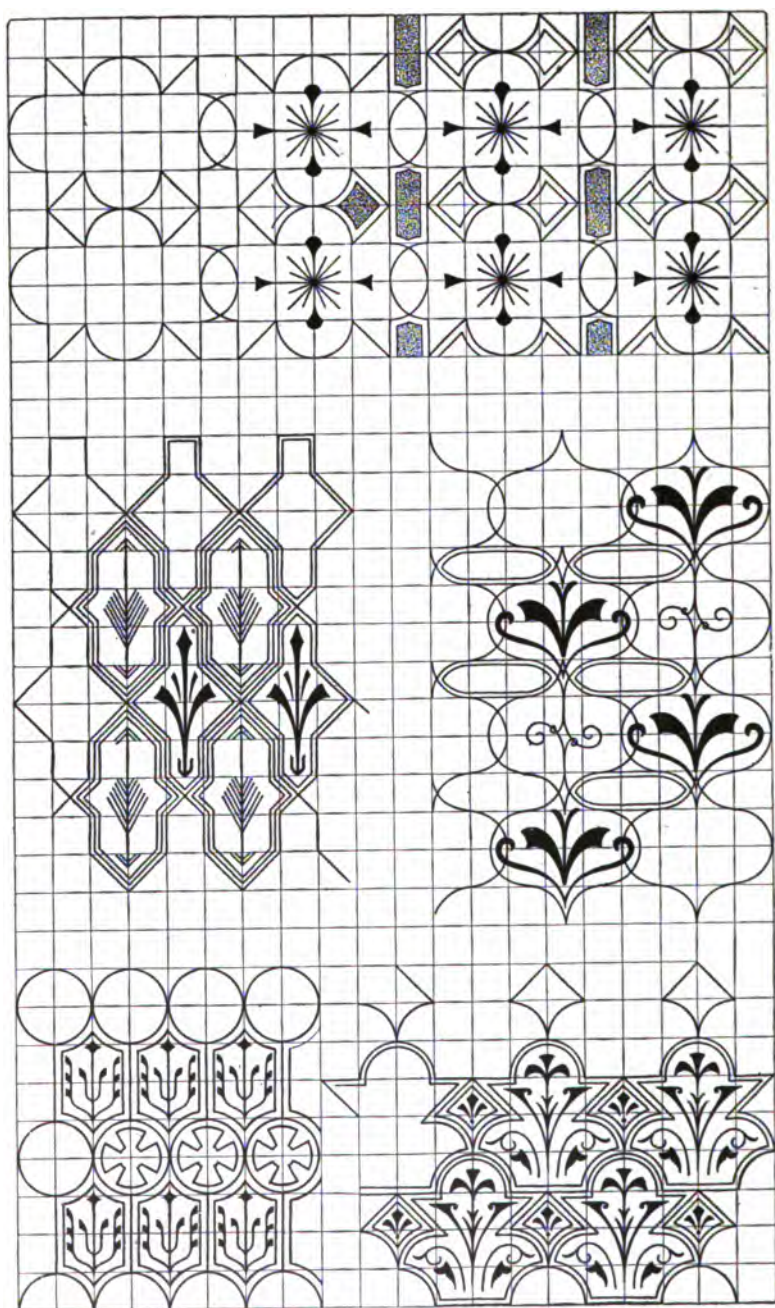


FIG. 25.

in Fig. 26, and at (c) a similar combination of the ogee curves, shown at (c) in Fig. 26. Straight lines alone may be combined almost without limit, as shown in Fig. 28; and a combination of curves and straight lines, or curves, straight lines, and spirals, gives a great



FIG. 26.

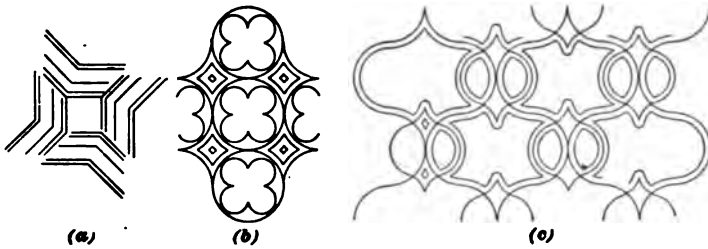


FIG. 27.

variety of forms, which can be introduced and combined to form an unlimited series of patterns.

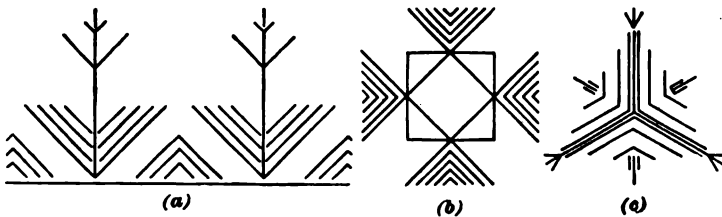


FIG. 28.

25. Brush Decoration of Pottery.—We have been considering so far only linear patterns as were found in pre-historic pottery when pottery was ornamented chiefly by incising the soft clay with a hard point. In later periods, however, pottery was decorated by means of the brush, and,

as has already been pointed out, the use of this employment led to much excellence in ornamental art.

It will now be readily understood how the combination of a few brush marks produced such important historic forms as the Greek palmette and honeysuckle ornament, and the fleur-de-lis and other devices common in medieval heraldry. In the first instance we considered the development of linear design in pottery decoration; then the application of pottery design to surface decoration and an analysis of forms that these arts produced; and, finally, a production of new forms from the elements of the original ones. If we now follow out the same idea and reproduce these forms with the variety that can be given them through brush decoration, we introduce an entirely new lot of expressions that linear decoration is incapable of carrying forth.

NATURAL ORNAMENT.

26. Union With Geometrical Ornament.—History shows that, as civilization advanced, greater ability for the expression of ornamental design was developed, and that mere geometrical design was found insufficient. Natural forms were therefore resorted to in order to add new features to the preexisting forms, and this was done in such a way that the new elements should harmonize with the old. The natural representations, though imitations of nature, were not pictorial copies, but modifications to suit their purpose, or, as we now consider it, conventional renderings; and it is the union of these two principles—the imitative and the inventive—that has given rise to the most important styles of ornamental art. Therefore, in applying natural forms to decoration, the student must always guard against the tendency to run into a pictorial representation, as pictorial forms do not harmonize with the older geometrical lines that may be called on to serve with them. Forms adopted from nature must be adapted by a judicious conventionalism.

CONVENTIONALISM IN ANCIENT ART.

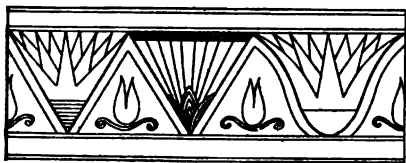
27. Kinds of Conventionalism.—In historic ornament we find two kinds of conventionalism: *first*, the **conventionalism of principles or ideas**, and *second*, the **conventionalism of facts**. The first deals only with the principles or ideas of growth common to a number of classes of plants or objects, and not representative of any specific form. The second deals with the individualizing of particular plants or objects, giving a more or less geometrical rendering of them.

28. Egyptian Conventionalism.—For instance, the art of the Egyptians, being purely symbolic, bound them to the conventionalism of facts, and in using their favorite flowers—the lotus and papyrus—in decorative art, they did not copy them pictorially, but conventionalized them in such a manner that they readily conveyed the idea of the type and at the same time obeyed the rules of their geometrical foundation.



FIG. 29.

In Fig. 29 the papyrus is shown at (a) and the lotus at (b), in their natural forms.



(a) (b) (c)

FIG. 30.

In Fig. 30 is shown a border based on the primitive zigzag of prehistoric ornament, and decorated at (a) with a conventional rendering of the lotus and at (b) with a conventional

rendering of the papyrus, while at (c) is shown the lotus flower with its curved outline as we see it in later Egyptian art after the curve of the zigzag had been evened up, as heretofore shown in Fig. 20.

29. Greek Conventionalism.—The art system of the Greeks, however, was of the other kind of conventionalism—

that of principles or ideas. Greek art not being symbolic, there was no necessity to represent particular plants (though at times they did so), and usually in their ornament we find principles expressed without indicating any particular natural type.

In Fig. 31 is shown an ornament found as a border on many vases. Its structural line is undoubtedly a development of the zigzag, while the leaf forms owe their origin to



FIG. 31.

the limitations of brush work, and the general character of the ornament is indicative of a class of running plants, but expressive of no particular plant.

Another point observable in Greek art is the way in which the scrolls are decorated, which, though based on a principle of vegetation, do not imitate any particular type.

In Fig. 32 is shown an example of Greek foliated ornament; it will be noticed that the principles there expressed are based on certain ideas derived from the vegetable world. In Fig. 33 is shown a branch of a shrub from nature, and it



FIG. 32.



FIG. 33.

will be observed that the part of the shrub above the branches is smaller than the part of the shrub below the branches, and that there is a considerable thickening of the

part where the main stem and the branching stem unite. The Greek ornament in Fig. 32 is simply a development of this principle, and does not imitate the plant at all, but ornaments the idea.

30. Development of Leaves.—Following the general growth and development of plants comes the consideration of their leaves; these should be studied systematically, according to their development. Such study will show that in spite of the apparent irregularity of leaf form there is a regular order in their outlines. It has already been shown that leaves develop according to some geometrical principle, and it will be found that the majority of leaves or leaf clusters may be enclosed within a circle or an

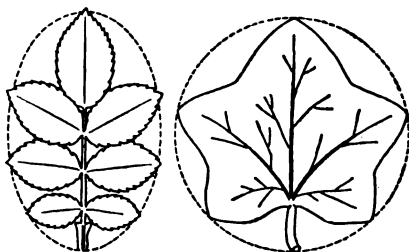


FIG. 34.

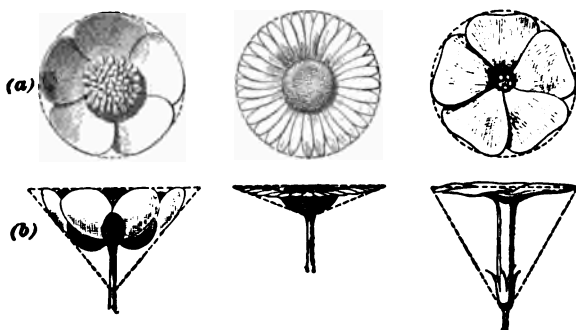


FIG. 35.

ellipse, as shown in Fig. 34; and a continuance of this principle to the study of flowers will show that the top views of many flowers are governed by the same geometrical figure, as shown at (a), Fig. 35, where the buttercup, daisy, and

phlox are shown, while at (*b*) the side views of these flowers are enclosed within a triangle.

31. Geometrical Forms in Nature.—The study of nature will show that this principle can be carried out extensively, even to the fruit or seeds of the various plants; and a careful study of individual forms and their details will enlighten the student to many ideas that can be reduced to a geometrical principle and thereby become conventionalized, while other facts observable in nature can also be conventionalized to give a closer representation of the form.

CONVENTIONAL ORNAMENT.

32. Natural Forms in Design.—We will now try to show how the study of nature can be applied in ornamental design. Suppose we return to Fig. 21 and take the design worked out at (*e*) and decorate it with forms from nature.

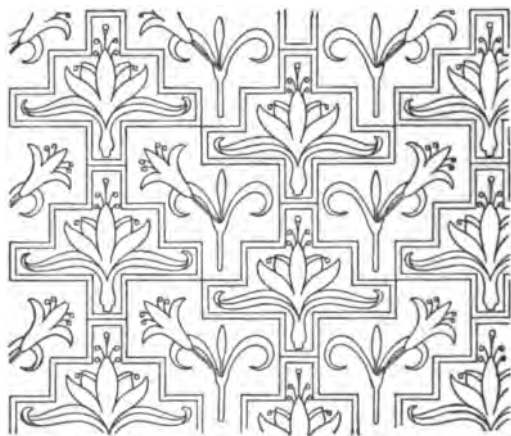


FIG. 36.

We will surround the extremities of the radiating lines with figures derived from the study of nature, such as the edges of some flowers, and produce a design somewhat as shown in Fig. 36. A similar treatment of (*c*), Fig. 22, will

produce a design somewhat as shown in Fig. 37. Fig. 38 is based on the development of (c), Fig. 23, and Fig. 39 is a development of (d'), Fig. 22.

33. Now, instead of dividing our surface up into rectangles, as we did in Figs. 21, 22, etc., we will let the outline of some natural form govern the subdivision; and in Fig. 40 we have a pattern where the contour of a five-

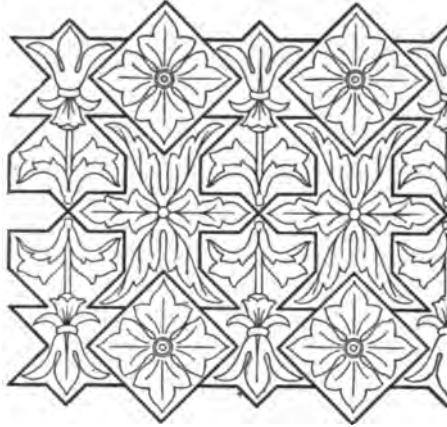


FIG. 37.

lobed leaf is used as the governing principle of the outline, within which other floral forms are used to form a surface decoration. This, it will immediately be observed, is the method of using natural forms practiced by oriental artists, and the pattern shown in Fig. 40 is strongly suggestive of Arabian art. For instance, at (a), Fig. 41, is shown a spray of leaves from nature, while at (b) is an Arabian design based on the outline of this spray of leaves.

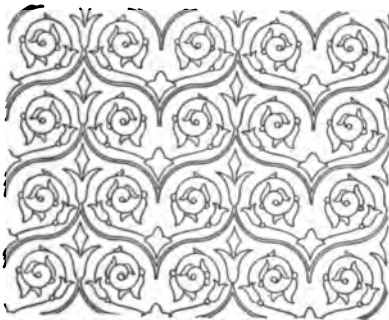


FIG. 38.

34. Arrangement of Ornament in Indian

Art.—In Indian art a favorite way of spacing out the ornament was after the manner shown in Fig. 42, where the leaf form is evidently of the lotus type. Diapers in Indian art are often designed as shown in Fig. 43, where there is no attempt made to represent any particular plant, but simply

an application of principles. Thus, we see that the conventionalism of principles is almost unlimited in its extent, and

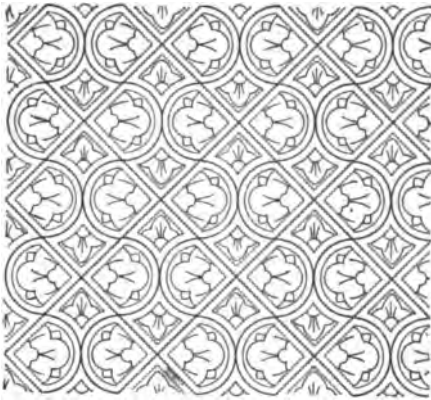


FIG. 39.

we will now consider the conventionalism of facts.

35. Conventionalizing a Plant Form.—Take, for instance, any plant suitable for the purpose, and adapt it to ornament. We are not going to make a picture of it, but study its characteristics, particularly those that

distinguish it from other plants, and idealize the original. It will be necessary to examine more than one specimen of the selected plant, because a peculiarity or accidental mark in one individual may not be found in another, and what we then require is a knowledge of the details and characteristics common to the entire family or kind to which the chosen specimen belongs. This knowledge can be acquired only by long and continued study of plant analysis, as a limited study is likely to render an untrue representation.



FIG. 40.

36. Realism and Conventionalism.—To copy nature as she is presented to us, with all the accidents and defects, would be to render her *realistically*. To correct nature by knowledge derived from the study of all her works in each

class, would be to treat her **naturally**. To reduce the result of these studies to a principle that expresses a simple fact with the fewest possible lines, as was done by

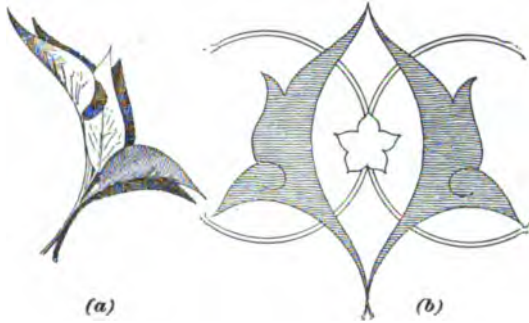


FIG. 41.

the Egyptians with their lotus blossom, is to treat nature **conventionally**.

For instance, at (a), Fig. 44, is shown an ivy leaf sketched from nature. It cannot be considered as ideal or natural, because its shape is not even the average shape of a number

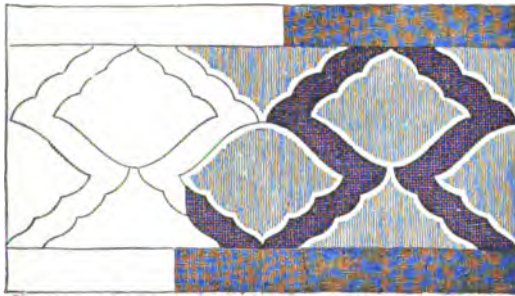


FIG. 42.

of leaves; therefore, (a) is a realistic drawing. At (b), however, is shown what might be considered a composite picture of a number of leaves possessing all the corrections of irregularities found in the entire class. This is a naturalistic rendering of the ivy leaf, and the reduction of this leaf to a

pentagonal form, shown in Fig. 34, reduces it to the simple expression of an idea, and presents the ivy leaf in a most conventional form.

37. Consideration of Purpose.—The extent, however, to which the modification of the details must be carried in

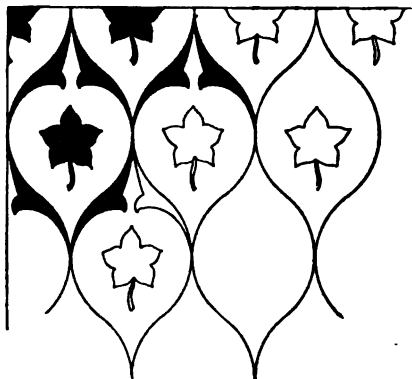


FIG. 43.

order to apply a plant form in design must be determined by the purpose of its application, whether the design is to be free or severe. If the design is to be severe, the geometrical rendering shown in Fig. 34 will be most serviceable, but, if the design is to be free, the naturalistic form shown at (b), Fig. 44, may be

used. The form shown at (a) with all its shadings and gradations, so strongly characteristic of the growing plant under certain conditions of lighting, is never suitable to ornament.

38. Taste in Conventionalism.—Now let us consider this application in Fig. 45. At (a) is shown the application of the flower to the primitive design illustrated at (c) in Fig. 21. The flattened curves of the flowers and leaves in the natural representation as shown in Fig. 46 are arranged at (a), Fig. 45, stiffly, in order to harmonize with the severe character of the design. But the character of the plant is maintained, because its main features

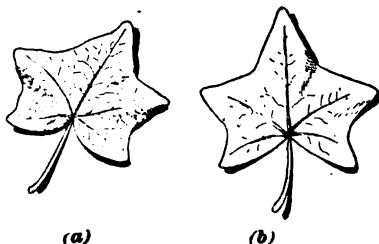


FIG. 44.

have not only been adhered to, but have been emphasized. Observe the indented ends of the petals, the serrated edges of the calyx, and the acutely lobed characteristic of

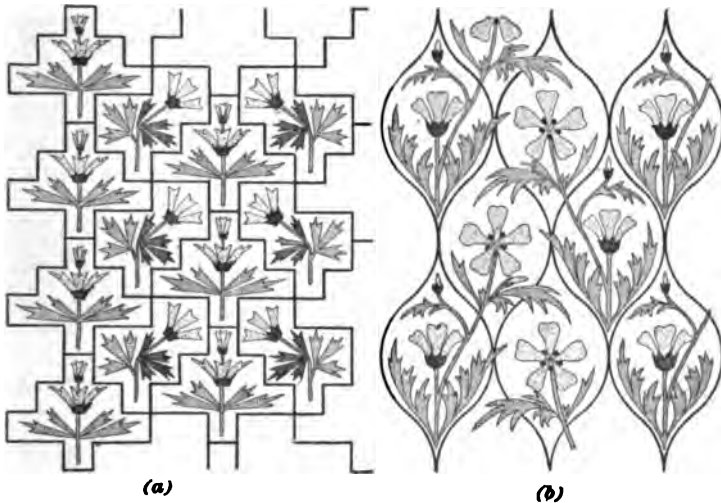


FIG. 45.

the leaves. At (b), Fig. 45, however, the lines forming the basis of the pattern are composed of curves and do not demand so severe a treatment of the ornamenting plant, and the flower is rendered in a freer and more naturalistic manner than was possible in the previous case.

39. Thus, it will be seen that the conventionalized rendering of a natural object requires careful consideration as to the extent to which the geometrical rendering shall have influence, and the idea that conventional rendering is simply a geometrical rendering, without consideration of the properties and application, is entirely wrong.



FIG. 46.

ELEMENTS OF ORNAMENT.

CLASSIFICATION OF ELEMENTS.

40. Although good ornament is possible with the simplest forms and materials, it is undoubtedly true that the higher the form of decorative art, the nobler must be the elements of which it is composed. The elements of ornament are therefore drawn from a great many different sources, but may be classified in a general way under two distinct heads—the **artificial** and the **natural**. These may again be subdivided, for the sake of convenience, into six subordinate classes—*geometrical*, *architectural*, *industrial*, *vegetable*, *animal*, and the *human figure*.

41. Under the subject of **geometrical** ornament, we include frets, traceries, diapers, interlacings, etc., together with those forms that are so simply developed in the ornament of the savage races. In **architectural** ornament, we include columns, entablatures, pediments, cartouches, etc. **Industrial** ornament may be considered to include all musical instruments, vases, spears, and other arms, as well as laces, ribbons, etc. **Vegetable** ornament embraces designs from plant life—leaves, flowers, fruits, festoons, various rosettes, etc.—while under the **animal** classification we have quadrupeds, fishes, birds, insects, and reptiles, as well as such imaginary figures as griffins, dragons, etc. The **human figure** used in design includes both natural and mythological representations, the terminals of foliage designs used in the Renaissance periods, the caryatids used in classic art, as well as certain creations in the mind of man, such as sphinxes, atlantes, mermaids, etc.

GEOMETRICAL ELEMENTS.

42. Frets.—The simplest form of geometrical elements we find in the **frets**, which throughout all ages and with all peoples seem to have been a favorite method of ornamenting

flat surfaces. They are used largely for borders, for which they are eminently fitted, but diapers are also formed of them in Japanese and Egyptian art.

In fretwork, the pattern and the ground are usually equally spaced, but this need not always be the case, as a strong effect is sometimes obtained by making a variation in this respect, as shown at (a), Fig. 47. Another variation that may be attained in frets is accomplished by changing the formation of the figure that forms their governing outline. It is not necessary that this figure should be



FIG. 47.

square or even rectangular, as is clearly illustrated at (b) and (c), the former being a parallelogram in the form of each section of its pattern, and the latter developed on the intersection of a series of diagonal lines, this being more characteristic of ornamental work, and suitable for flat or inclined surfaces. The introduction of curved lines in this class of work, either in conjunction with straight lines or entirely by themselves, leads us to various interlaced patterns, including the guilloche and basketwork.

43. The study of geometrical ornament is of particular value on account of the elements that lie at the base of the elaborate and intricate patterns that oriental artists and the Middle-Age mosaic workers so freely indulged in. With a thorough understanding of geometrical ornament and the possibilities of geometrical arrangement, the designing of complex and intricate patterns becomes a comparatively simple task.

ARCHITECTURAL ELEMENTS.

44. Construction Allied With Beauty.—Next in the order of our subdivision we take up **architectural elements**, and we must consider that architecture properly

comprehended is the art of construction allied with beauty—not construction made beautiful by superadded decoration, but construction with beauty incorporated with it. In all the best periods of ornamental art, it has been architecture that has afforded the greatest field for its development; and in pottery, stained and painted glass, ironwork, jewelry, and the decoration of pilasters, shafts, etc., architectural construction has had a most marked influence.

In decorated designs, certain architectural forms have been used in their pure and simple form, but most frequently they have been modified by imagination so as to bring them in harmony with other details with which they are associated. Hence, in some forms of ornament, we find but a suggestion of architecture, while, in others, a distinctive characteristic.

45. Adaptation of Architectural Forms.—In adapting architectural forms to a surface design, it is entirely unnecessary that the stiffness and structural rigidity that is demanded in architectural practice should be maintained in the surface pattern, because the same structural conditions do not exist. There is no physical weight to be provided for, and, in the decoration, the introduction of the appearance of weight is all that is necessary so long as the eye is satisfied.

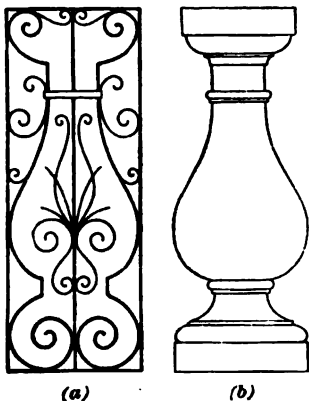


FIG. 48.

The representation of a **frieze** may be taken from a carved prototype, but the details of the relief expressed in the original carving need form no part of the textile or other surface design, the element of beauty lying in the direction and proportioning of the lines only; the frieze may therefore be reduced to a simple surface treatment.

The same may be said in the design of an **iron grille**

either for a railing or for a gate. The design should be influenced if not governed by some characteristic of a similar detail in its original material. For instance, the design of the fence panel shown at (a), Fig. 48, is clearly copied in its general outline from the stone baluster of the classic balustrade shown at (b). The treatment of the head-piece over the gateway shown at (a), Fig. 49, is clearly developed

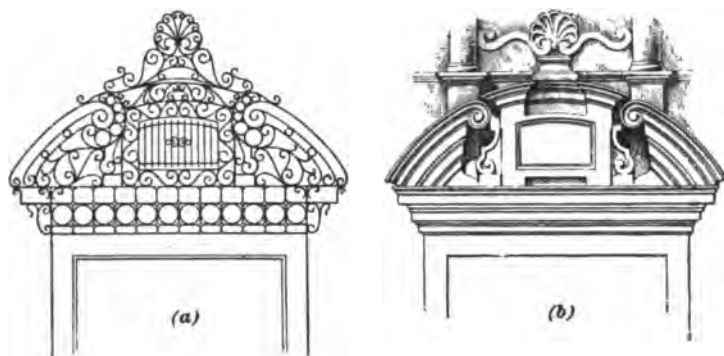


FIG. 49.

from the broken pediment characteristic of certain Renaissance work shown at (b). These details as reproduced in iron are not copies of the original, but simply ornamental forms founded on a principle of earlier construction. In the same manner a well-designed iron railing is influenced in its proportions and composition by the architectural orders and classic proportions for balustrades.

46. The Volute Scroll.—Some of the ornamental details derived in architecture and applied in decorative art will now be considered as to their origin and proper treatment. There is, for instance, the little **volute scroll** so characteristic of the Corinthian column as it curls out under the corner of the abacus. The gracefulness of this feature and its apparent strength render it particularly adaptable in setting out friezes and other purely ornamental arrangements where the qualities of grace and strength are to be

combined, as shown in Fig. 50, where a frieze is designed



FIG. 50.

using one of the forms of scroll shown in Fig. 51, all of

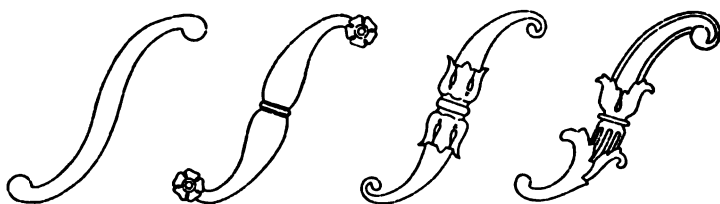
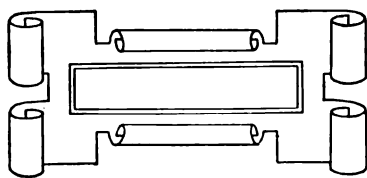
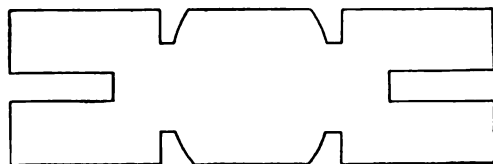


FIG. 51.

which have been taken from the capitals of the various modifications of the Corinthian.



(a)



(b)

FIG. 52.

47. The Cartouch.—The **cartouch** is another architectural detail that enters largely into decorative design; it owes its origin to the ancient use of paper or parchment labels for inscriptions and badges. The margins of these labels were usually cut in some ornamental shape and afterwards curled into scroll forms of an ornamental character. This led to a systematic development, and, subsequently, in conjunction with interlaced ornament, produced a new kind of decorative work that we usually term **cartouch work**. This element is invaluable to the designer, both in its capacity as a filling-in



FIG. 53.

treatment for an uninteresting piece of background, and as a strengthening element to the general composition.

At (a), Fig. 52, is shown one of the earliest and simplest forms of this cartouch work, while at (b) is shown the paper



FIG. 54.

from which it is cut. In Figs. 53 and 54 are shown examples of advanced and more complicated cartouches, developed from the same general principle. It is easy to understand the development of the cartouch form into the carved work shown in Fig. 53, where a shield-shaped cartouch, with its curled and ornamental edges, is carved in relief with the human figure. In Fig. 54 is shown a further

development of the ornament, in order to convert it into a frame, as was done during the period of the Italian Renaissance. The general form varied, but became more elaborate in design as the Renaissance spread into France and Germany.

INDUSTRIAL ELEMENTS.

48. Association With Architectural Elements.—The industrial elements of design are not widely separated from the architectural class, and are considered here under a different heading simply as a matter of convenience. Industrial objects, such as tools, armor, musical instruments, etc., are used in various ways in decoration, usually for purely symbolic purposes. These articles are usually introduced purely from an esthetic sense, with no other purpose than to please the sense of vision, and are therefore arranged to present to the best advantage the beauty of their forms.

49. Symbolism.—In the symbolic use of these details, it should always be remembered that there are two ideas associated with nearly all symbols—one, the idea of recalling something to the memory; the other, the expression of an entirely new idea, or the illustration of one. Thus, the Latin cross may stand as an expression or as a symbol of the Christian faith, or it may act as a reminder of the crucifixion of Christ. Another case is where the musical instrument, the lyre, so frequently used to express the idea of music, may with equal propriety set forth a reminder of the ancient use of that instrument in the classic musical entertainments.

50. Prehistoric Emblems.—At (*a*), Fig. 55, is shown a prehistoric emblem of God. It had its origin almost undoubtedly in early sun worship, which fact is attested by the circle, and the survival of this form is seen in the halo, or nimbus, painted over the heads of the saints during the Middle Ages. At (*b*) we have the Egyptian symbol of divinity, but of a more complex character. The circle is

still retained but is supported by outstretched wings, indicative of sovereignty and ubiquity of the deity. The scarabæus of the Egyptians, shown at (c), was a detail that appeared frequently in their designs. At (d) we have the nimbus, or halo, characteristic of the Christian symbol of glory, and at (e), (f), (g), and (h) we have four forms of

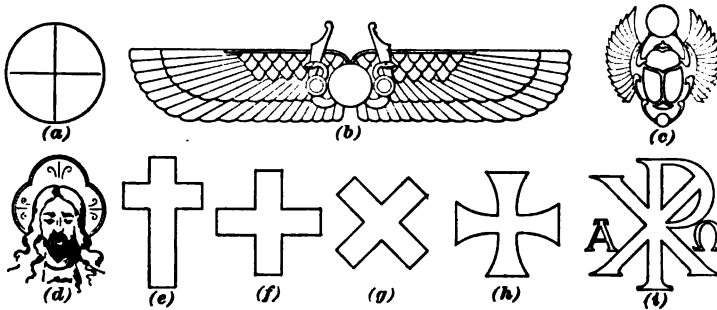


FIG. 55.

crosses known under the names of the Latin cross at (e), the Greek cross at (f), the cross of St. Andrew at (g), and the Maltese cross at (h). At (i) is shown the old symbolic monogram of Christ, composed of the two Greek letters of his name X (*chi*) and P (*rho*), with A (*alpha*) and Ω (*omega*), the first and last letters of the Greek alphabet, added to indicate his eternal character.

51. These few forms will serve to illustrate the extent to which symbolism enters into modern ornamental design, and a little study and thought will bring to the student's mind and attention numerous other examples of the same kind.

NATURAL ELEMENTS.

52. Vegetable Forms.—Of the elements of design that are taken directly from nature, our first consideration will naturally be the **vegetable forms**. Here the material presented to the designer is not only unlimited in style, but is easy of adaptation to all his requirements.

In using plant forms for design, there is material for the designer in every part of the growth—the roots, stalk, leaves, flowers, and seed all contain details that may suggest ideas to the designer. While there may be nothing of great beauty in the root of a flower itself, yet there is always sufficient detail of importance there, and, if properly studied, can give rise to beautiful ideas.

53. Thickening of Stem at Points of Departure.

In all good ornament of a flowing character, no matter how conventionally it may be arranged, it has always been the practice that there should be a thickening of the stem at the point of departure of the two reversed growths, as shown at (a), Fig. 56; or, if more than one starting point is used, a stop is usually introduced between the two sections of



FIG. 56.

design that are running together, as at (b).

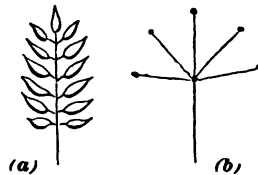


FIG. 57.

54. Botanical Principles in Design.

Now let us see how the application of some of these principles of growth can be properly considered in ornamental design. Let us study the botanical aspect for a moment. We have in botany

a term called **inflorescence**, which is the arrangement or growth of flowers on the stem, the simplest form of which is shown at (*a*), Fig. 57. Taking its principle of growth and not copying in any way the specimens, we can introduce it in the design shown at (*c*), where it forms a perfectly proper termination with the scroll, with which it harmonizes, as well as with the longitudinal character of the border pattern. At (*b*) is shown another form of inflorescence, and at (*d*) is shown its application to a scroll ornament as before.

55. There are many different characteristics of botanical growth, each of which is capable of furnishing an idea that can be carried out as simply as the above, and always to good advantage, in the product of satisfactory designs.

ANIMAL ELEMENTS.

56. Frequent Use in Design.—**Animal elements** have always been used in ornamental art in a more or less naturalistic manner, and, though these forms are more difficult to treat ornamentally than are inanimate forms, the ancient artist used them frequently, as animal forms will increase the interest in any composition. In Celtic ornament, for instance, elements from the animal world are introduced even with the purest geometrical designs, and we find down to the present day that conventionalized representations from the animal world are most conspicuous details of heraldry.

In certain periods of art, animal forms were preferred even to the vegetable forms, as man in his early condition had a closer interest in certain classes of beasts that aided him in his struggle for existence, such as the horse, reindeer, dog, etc. His admiration for them lay more in his comprehension of their usefulness than in his admiration of their form, as his chief business in life at that time was the provision for his natural wants and his own protection.

57. Imaginary Beasts.—In later periods, when man arrived at an easier state of living, he became more sensitive to the beauty of the world, and it is then that we have the naturalistic rendering of animal form giving way to more conventional representations, such as are found in the imaginary beasts, like griffins, dragons, and chimeras.

Throughout the history of art, the formation of any style of ornament depends largely on some preceding style, and the earliest form of development that we have must necessarily have arisen from the geometric, or a combination of some later form with an earlier geometric form. This combination of form naturally leads to a combination of conventional ideas, and we have the union of the attributes of one animal with those of another. We have already considered the two kinds of conventionalism that can exist—one, the conventionalism of facts, and the other, the conventionalism of ideas.

58. Conventionalizing Animal Forms.—In the conventionalizing of animal forms, it is usual to express the



FIG. 58.

idea by means of a symbolic representation and the fact by a conventional rendering of the animal. To make this more clear, we will take, for instance, the griffin, shown in Fig. 58, which is composed of the body of the lion and the head and wings of a bird, and is usually symbolic of

watchfulness, strength, alertness, and swiftness. We find this figure on the piers of gateways, and it was often used by the Greeks to adorn certain portions of their temples.

In this representation, we conventionalize the idea by representing it symbolically, the eagle's head and wings and the expression of the added ears being symbolic of watchfulness, alertness, and swiftness, whereas the lion's body is symbolic of strength. The conventionalized facts we find in the reduction of these emblems to a form by which they can be combined in one figure.

59. Sphinx, Wivern, Etc.—Other figures of this character are the **sphinx**, shown in Fig. 59, which combines the



FIG. 59.

human head with the body of the lion—symbolic of intelligence and strength; the **wivern**, shown in Fig. 60, which consists of a sort of winged serpent with a bird's head and legs, and carries the same idea as the griffin, with the addition of wisdom indicated by the serpent's body, and alertness during the nocturnal hours from the bat-like form of its wings.

Another figure of this character, which is of Greek



FIG. 60.

origin, is the **chimera**, shown in Fig. 61. This figure is supposed to typify a volcanic mountain in Greece, which, according to various legends, was infested with lions at the top, and around the middle with goats, while the foot of



FIG. 61.

the mountain abounded in venomous snakes. The chimera therefore combining the forms of the lion, goat, and serpent, from whose mouths issued flames and deadly gases, became the symbol of terror and devastation.

The **dragon** shown in Fig. 62 has ever been an emblem of the evil forces of the natural and moral world. It com-



FIG. 62.

bines in its characteristics the litheness and repulsiveness of the lizard and serpent, the swiftness of action characteristic of various winged creatures, and the fierceness and

belligerency of the carnivorous animals from the form of its teeth and claws. To intensify its evil appearance, it is frequently represented as belching flames.

There are numerous other animals of a mythical character that have their origin purely in the conventionalism of some idea, and the reduction of numerous animal forms to the conventional rendering is almost unlimited in its application.

60. Difficulty of Adapting Animal Forms.—In the case of animal forms, it is not so easy to adapt them to the requirements of ornamental design as it is the free and varied growth of plants. The latter have a multitudinous repetition of parts that enables the designer to adapt them without violence to nature, while animal forms have a proscribed and limited number of parts that narrows the limit of their employment and presents difficulties in the way of their successful adaptation. It is therefore necessary that animal forms should be analyzed in the same manner that plant forms have been analyzed in this course of study, in order to learn the characteristic lines of their composition and reduce them to a form capable of conventional rendering.

61. It is comparatively easy to draw accurately any animal form, and yet such a form is likely to be utterly unfit for decorative purposes, while a less accurate representation may be highly suited to decorative work; and we will find that the animal forms usually seen in the designs of the more barbaric nations are better suited to ornamental art than the realistic renderings of the later periods.

62. Birds and Running Ornaments.—Birds also may be combined successfully with running ornament, as they are not only graceful in themselves, but are pleasantly associated with all plant growth, and they can be arranged so that their lines flow with the lines of the ornament and harmonize with it perfectly. Certain quadrupeds can thus be treated also, but not always so readily.

At (a), Fig. 63, is shown a border ornament consisting of a foliated design, through which a dog is seen running after a bird, while at (b) is a rough outline of this same design

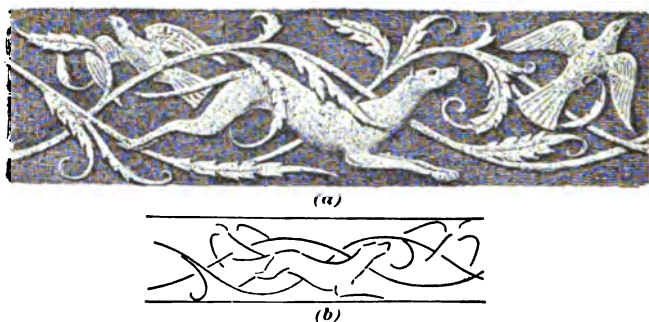


FIG. 63.

showing how the curves of the dog's body are in harmony with those of the ornament, and how the introduction of this detail is so suitable in the combination shown.

Again, at (a), Fig. 64, is shown a design where the bird alone is introduced, while at (b) the outline drawing of it shows the arrangement of the foliated design and its rela-

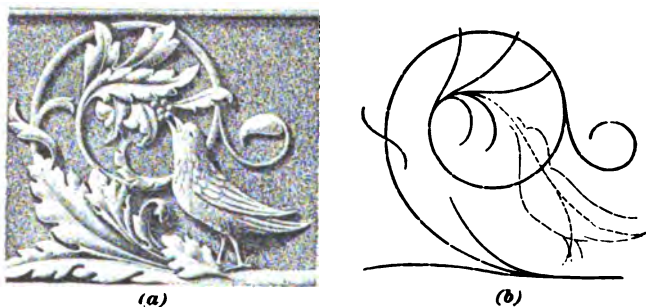


FIG. 64.

tion to the bird form, together with the line of curvature that makes the two details harmonize, the latter being shown in dots. Fig. 64 is taken from a stone carving of the sixteenth century.

63. Wings in Ornament.—While we are considering the introduction of bird forms it will be wise for us to consider the subject of **wings** and the introduction of wings in ornament. There are few details of animal form that have been so extensively introduced in various conventionalized forms, to represent both ideas and facts, as the wings of birds and bats. Though the bird's wing is composed of flesh and feathers, and the bat's wing is made up of a skeleton framework between the parts of which a thin skin is



FIG. 65.

stretched, the principle governing the outline of each is practically the same, and, in addition to this, it might be noted that the structure of wings and that of the human arm is very closely allied.

At (a), Fig. 65, is shown the outline of a bird's wing, while at (b) is shown the outline of a bat's wing, and at (c), an outline of the bone construction of the human arm. The relative arrangement of these details will show their relation in structure, while Fig. 66 shows three forms of

bird's wing, differing materially in outline, owing to the arrangement of the feathers, but based on precisely the same skeleton construction as is shown at (a), Fig. 65.

64. Proportions of Wings.—At (a), Fig. 66, the wing represented is that of a common sparrow, while (b) shows the pigeon's wing, and (c), that of the sea swallow. It will be observed that in the order they are named these wings are

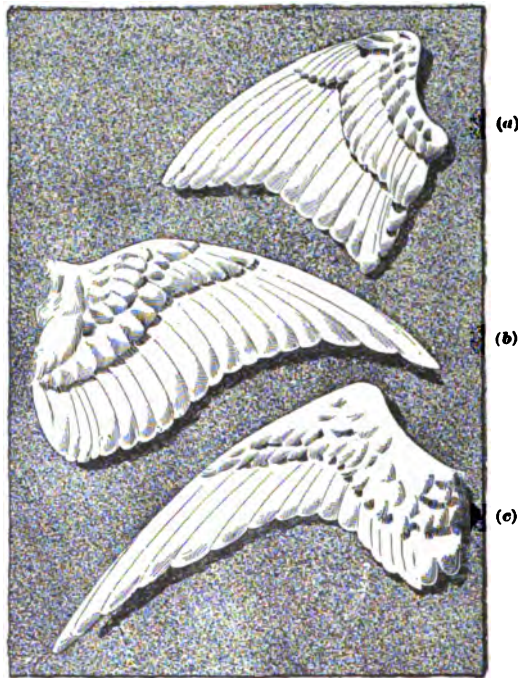


FIG. 66.

from birds each of whose flight is more prolonged than the former—the sparrow, flying but short distances; the pigeon, usually capable of traveling a mile or more on the wing; while the sea swallow is flying a majority of the time. The relative extent of the outward extremity of the wing, it

will be observed, increases with the flying qualities of the bird. In applying these wing forms to design, it is frequently necessary to take these details into consideration.

65. Application of Wings. — We have already considered the application of the wing in the design of the winged globe shown at (b), Fig. 55, but its application to other forms we will consider here. In Fig. 67 is shown the characteristic Egyptian hieroglyph of the goddess Neith, who carries in each hand a symbol, and whose out-



FIG. 67.

stretched wings typify her world-wide sovereignty.



FIG. 68.

In more modern application, we find the use of wings in the Greek sphinx, shown in Fig. 68, where the treatment is less conventional than in the Egyptian style, and the possession of the wings distinguishes this sphinx from the one of Egyptian design. Fig. 69 shows a still more modern application, where, in a female figure, the wings replace the arms and are outstretched in the

position usually considered symbolic of untiring activity or eternal protection.



FIG. 69.

66. Feathers.— Besides the wings, in a total by themselves, we have the individual feathers as a subject for decoration, and many designs are based on these details. At (a), Fig. 70, are shown the ends of pea-

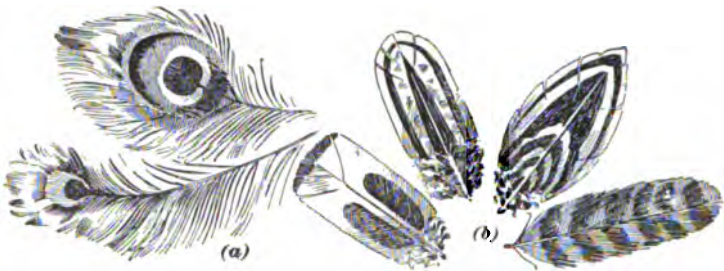


FIG. 70.

cock feathers, which have always been a favorite type for ornamentation, while at (b) are shown various types of feathers from the pheasant in different stages of their development, with their characteristic spots and markings.

At (a), Fig. 71, is shown a design for a border, the elements of which are derived from the peacock feather, while at (b) are shown three designs based on the formation

illustrated in the forms of the pheasant's feather shown at (b), Fig. 70.

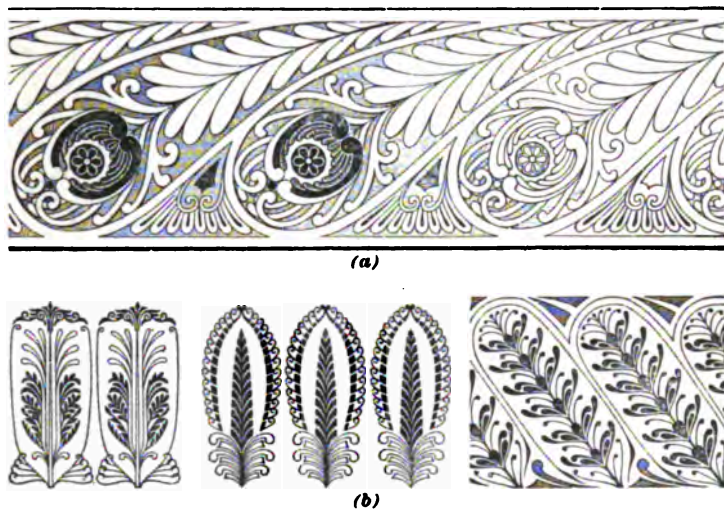


FIG. 71.

67. Insects in Design.—The use of insects in decorative design is not as extensive as of birds, though the markings of the wings of some of them, particularly the butterfly, are easily applicable in some characters of design, as shown

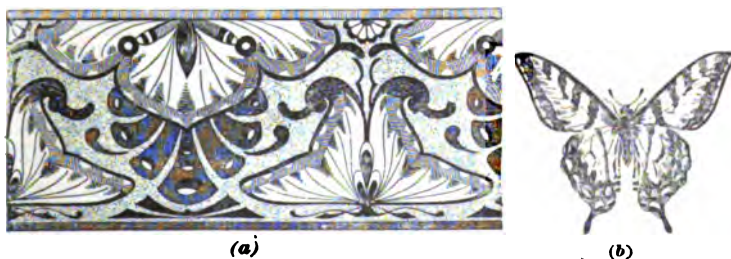


FIG. 72.

at (a), Fig. 72, where a border is designed on principles taken from the butterfly's wing illustrated at (b), and the simple mosquito, illustrated in a conventional rendering at

(a), Fig. 73, is easily applicable to a diaper ornament, as shown at (b). There is no limit to the extent to which these

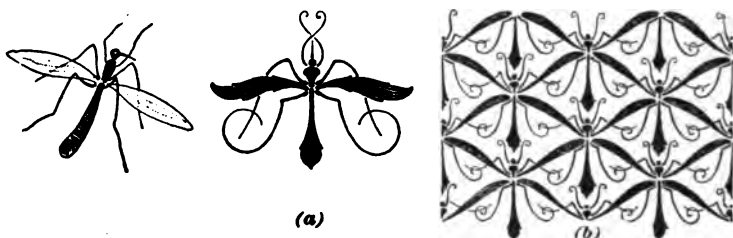


FIG. 73.

forms may be varied, or combined with plant forms, to produce any given variety of ornament.

68. Fishes in Ornament.—The use of fishes in ornamental art is somewhat limited. With the exception of the dolphin, we have very few historic representations of this class of animal; but, in order that there may be a thorough understanding of the details that must be considered in the designing of any fish-like form, there is illustrated in Fig. 74

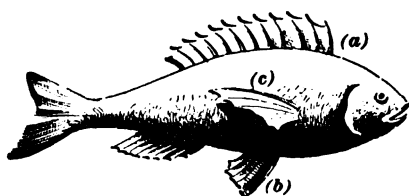


FIG. 74.

a typical fish, with the five principal fins that exist in nearly every example, though they may be varied in form. At (a) is the *dorsal fin*; at (b), the *ventral fin*; and at (c), the *pec-*

toral fin. The tail is technically known as the *caudal fin*, and the fin between the ventral and the tail is termed the *anal fin*.

Each of these fins is developed to a greater or less degree in different fishes, in some of which it is divided so as to present two fins. For instance, it is not unusual to find two or more dorsal or two or more ventral or anal fins on one fish, and in rendering them for conventional treatment, it would be well to bear in mind a certain type of fish from which to study, and to preserve the characteristics of this fish in the rendering.

For instance, we have at (*a*), Fig. 75, a fish wherein the pectoral fins are so enlarged as to appear almost as wings,

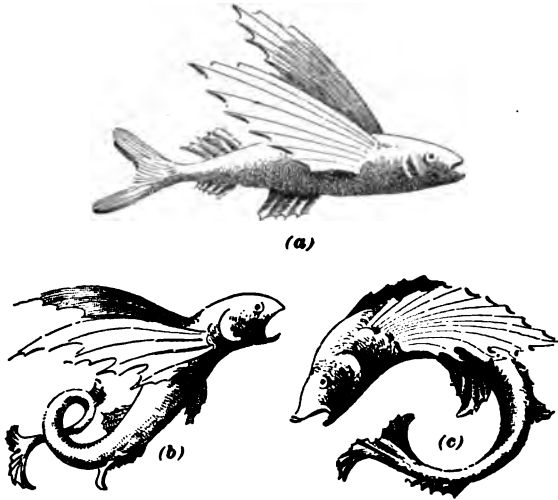


FIG. 75.

while at (*b*) and (*c*) are two conventional renderings typifying the characteristics of this fish but reducing it to a purely ornamental form.

69. Snakes and Lizards.—There is no limit to which this can be carried, not only with fish but with **snakes** and **lizards**, as the latter sometimes introduces an element of frivolity and relieves the seriousness of a purely conventional and constructive composition. Serpents have always formed a favorite type for the design of all periods, not only in flat-surface ornament but also in the design of certain utensils, where, as in Fig. 76, they are used to form the handle of a ewer.

The combination of fishes and reptiles gives, again, an opportunity to



FIG. 76.

express conventionally the attributes of two animals, as was done in the combination of reptiles and birds, or of birds and animals, and the introduction of shells and shell-like forms is not only highly appropriate in designs where elements from the sea are characteristic, but we find that shells fit themselves admirably, with very little alteration in their detail, to the purposes of the designer.

THE HUMAN FIGURE.

70. The Noblest Element of Design.—The human figure is the highest and noblest of all the elements from which the designer can draw ideas, and it is at the same time the most difficult one to handle in any character of a design. It does not lend itself to conventionalism and conventional rendering as readily as do the vegetable and animal forms, and the rendering of its proportion is more difficult to learn than any other subject.

71. Proportions of the Human Figure.—In order that the human figure might possess uniformity in its proportions, the Egyptians drew up a system by which different members of the body could be maintained in relatively the same ratio at all times, and it is believed that this same system was adopted by the Greeks, although carried to greater refinement. A Greek writer on the subject states that "Nature has so composed the human body that the face from the chin to the top of the forehead and roots of the hair should be one-tenth the height, and that the palm of the hand from the wrist joint to the tip of the middle finger should possess the same measurement; that from the chin to the highest point of the head should be one-eighth the height, and from the chest to the roots of the hair should be one-sixth."

Carrying out the measurements, and, at the same time, calling the student's attention to a number of others, we have the proportions as shown in Fig. 77. Here the figure is shown with one arm extended, drawn within the

square $a b c d$, and the horizontal and vertical lines dividing this square into sixteen smaller squares determine the position of important parts of the body.

Thus, the distance $b e$ is one-fourth the height of the body, and the line passes through the middle of the chest; the distance $b f$ is one-eighth the height of the body, and the line

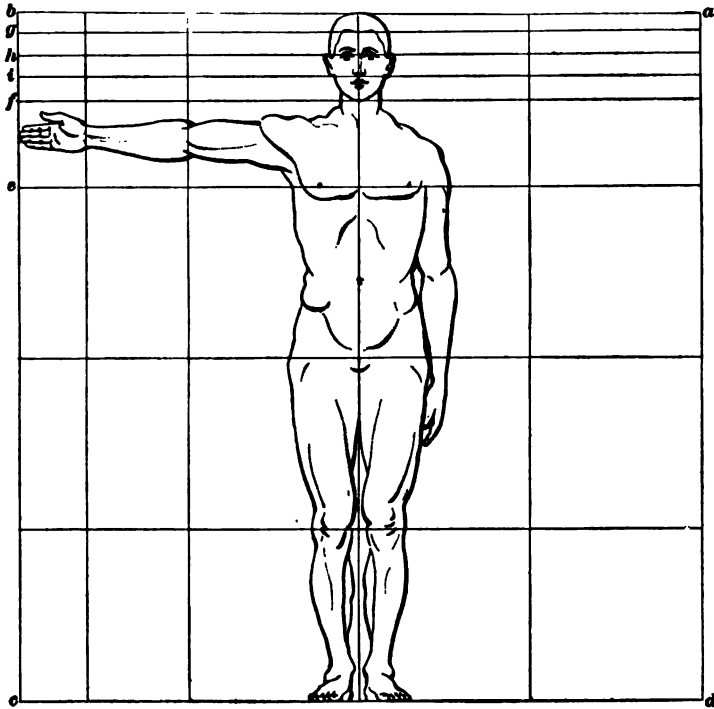


FIG. 77.

passes under the chin; the distance $f g$ is one-tenth the height of the body, and the line passes tangent to the chin and through the roots of the hair; $f h$ is one-sixteenth the height of the body, and marks the distance of the eyes above the chin; while $f i$ is one thirty-second the height of the body, and marks the distance of the bottom of the nose above the chin. It will be here observed that the arms extended horizontally measure the same distance across,

from the tip of the middle finger of one hand to that of the other, a distance equal to the height of the body. The lines across the elbow, thigh, knee, calf of the leg, etc. show the breadth of each member in proportion to the height of the body at the point marked.

It is not the intention of this description to give a complete systematic set of rules for the drawing of the human figure, but simply to indicate the general proportions by which the student can outline a figure in a design and keep it in relative proportion to the other elements of the composition.

72. Harmony in Adaptation.—In adapting figures to design, it is of the utmost importance that they should harmonize with the ornament, in its direction and line, with which they are associated, as well as that the figures should be so posed as to be in harmony with the space they are to fill. Figures simply drawn to fill a space, without consideration of their harmony with that space, have the appearance of being stuck in the design instead of forming an integral part of it. Therefore, to successfully handle the human figure as an ornamental element, the student must not copy his model exactly, but must idealize as much as possible, and by constant study familiarize himself with the ornamental lines that pervade the human structure.

The study of anatomy, to a general extent, will be of great assistance but cannot be altogether relied on by the ornamentalist, as it is the surface forms and lines that concern him mostly, and these do not altogether agree with the under structure of the body.

The only way to become familiar with the details and beauties of curves characteristic of the human figure is to study them frequently and constantly and make drawings from life. The general proportions and characteristics may be learned by drawing from copy, but different poses and arrangements can be acquired in no superficial study, and the designer that finds the human form necessary in his compositions must make a separate study of it and devote

nearly as much time to this branch as to all the rest of his studies combined.

73. Fundamental Principles of Figure Design.—In applying the human form in design, there are certain fundamental principles that must ever be recognized. For instance, at (a), Fig. 78, is shown the outline of a figure resting the

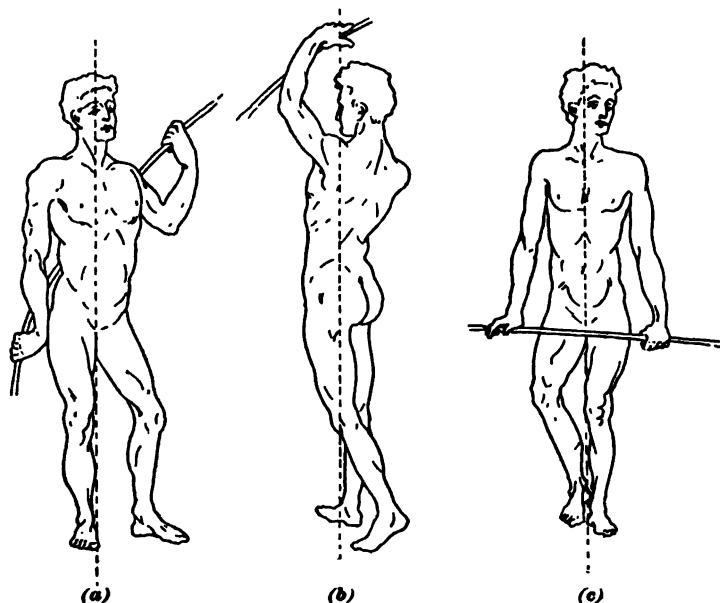


FIG. 78.

bulk of the weight on one leg, and it will be observed that there is a general line of support, which is shown dotted throughout the body, from the ankle to the neck, and that about this line of support the body is disposed in almost equal masses, as shown.

74. Another principle that must be considered is that, in drawing the upper and lower limbs, one is likely to lay too much detail upon their outline and shape rather than to appreciate the value of these elements and the general lines that govern their arrangement. For instance, though the

side view of the leg is composed of a series of convex lines, these should not be given too much prominence over the general proportion of the whole limb, as such a rendering would give a result somewhat as shown at (*a*), Fig. 79; while a closer observation of this whole member would lead to the discovery that, notwithstanding the existence of convex curves in the shin, the line in the front of the leg is concave, as shown at (*b*), while that of the back is convex.

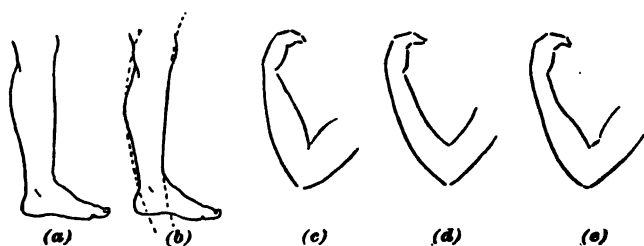


FIG. 79.

The same may be said of the forearm, which is frequently drawn as shown at (*c*), Fig. 79, with the inside of the forearm convex, in order to show the softness of the curves at that point; but, as a matter of fact, if its general contour were taken into account, it would be found to be concave, as shown at (*d*), and a proper rendering of it would be more as shown at (*e*).

The student should carefully analyze these details in studying the human figure, not only as a guide to its truthful representation, but also in order to study the details of its conventionalism to arrive at a proper principle for its general design—a principle that can be enlarged upon after the main outlines have been established.

75. Difficulty of Free Rendering.—In considering the application of the human figure to decorative purposes, the same rules hold good as for decoration with foliage, but its rendering is, of course, more difficult, as we cannot handle it as freely as we do the plants. The human figure has to be taken in its entirety, without exaggerating its

structure in any way (except for the purpose of caricature, which does not enter into this course of study), and its elementary lines must be thoroughly comprehended by the student.

Details of the human figure have been combined with animals, as has heretofore been shown and illustrated, as in the sphinx, etc., and we will presently have occasion to give other examples. The combination of the human figure with foliage is characteristic of many designs of the Renaissance period, where the lower portions of the body were permitted to terminate in leaf-like forms and enter into the foliated ornament of an arabesque or panel, as shown in Fig. 80.



FIG. 80.

76. This style of treatment probably grew out of a development shown in Fig. 81, where at (a) is shown a half figure that might appear more suitable to the filling of a

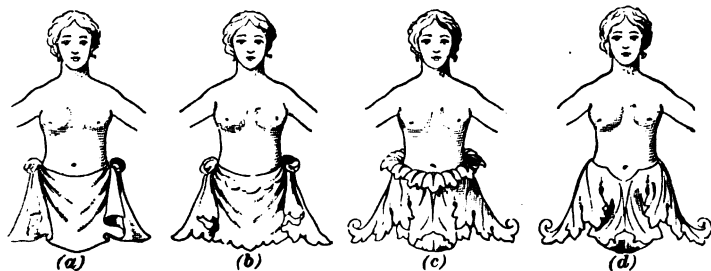


FIG. 81.

certain space than the full-length figure. The lower part of the figure is covered by drapery, the elaboration of the folds

of which brings it to the form of a design shown at (*b*), which further elaboration brings to a foliated form as at (*c*), and subsequent renderings form a part of the figure as illustrated at (*d*). Attention is simply called to this here to illustrate a possible progress and growth and to show the rationalism of foliated terminations under certain circumstances.

77. Human Figures as Supports.—The use of the human figure as a support in the place of a column, or occa-



FIG. 82.



FIG. 83.

sionally, with artificial terminations, under brackets, is shown in Fig. 82, which is taken from one of the caryatids

used in the north porch of the Erechtheum at Athens, while in Fig. 83 is shown a front and side view of the Egyptian method of carving human figures as supports, though, in the latter case, it will be observed that the figure does not actually support any of the superimposed load, but simply rests against a pier. The Greek artists, apparently appreciating the inappropriateness of the human figure to act as a column and permanently support something superimposed, increased the proportions and gave them a strong architectonic feeling.

78. During the Renaissance period, the use of figures as supporting members was very much misunderstood, and the combination of these elements with the attempt at gracefulness of line led to such misconceptions as shown in Fig. 84, where the curved dotted line shows the real line of support through the figures, and, at the same time, gives an expression of weakness to the detail as an architectural member.



FIG. 84.



FIG. 85.

A comparison of this with the Greek figure shown in Fig. 82 will readily illustrate the error made by the more modern designers.

The use of half figures, called **termini**, is characteristic of the Renaissance period, an example of which is shown in



FIG. 86.

Fig. 85. No great load should be superimposed upon them, in order that their application may be harmonious.

79. Application of Wings. — In the application of wings and feathers to the human figure, Egyptian art usually attached the wings below the arms, as shown in Fig. 67, while the Assyrians usually attached them behind the shoulders, as shown in Fig. 86,

and, although the latter method is the less rational one from an anatomical structure, it is the one that survives at



FIG. 87.

the present day, and is usually used in modern work. Fig. 87 is taken from Greek vase paintings, and shows the Greeks' idea of wing treatment; while the Renaissance example shown in Fig. 69 possesses an exaggerated outline, the curves of which in no way appear to agree with the hidden structure, though the development of the wings in the place of arms is much more rational than the form shown in Fig. 87.

80. Fabulous Creatures.—Many fabulous creatures—partly human and partly animal—have been created during the periods of grotesque art, and to Greek art we are indebted for most of these mythical creatures, as their central idea was the glorification of the human form. Greek mythology had so many deities representative of different characteristics and ideas that separate gods and goddesses, illustrative of separate conceptions, were indispensable; and not only were literature, arts, and sciences typified by a form of human being, but the seas, the rivers, the mountains, the woods, the trees, and the rocks were all representatively depicted in some ideal form, and even the natural devices and calamities of mankind had some symbol in human guise.



FIG. 88.

When these, however, were insufficient to properly express their ideas, the human form was combined with that of a bird or animal, or some reptile, in order to complete the symbolism as far as possible. Therefore, in their personification

of the free untrammelled woodland life, they gave to the figure of a man the legs and horns of a goat, to intensify the idea of wild freedom, and as a result we have the mythological forms of the satyr and Pan illustrated in Fig. 88.

81. Greek Sphinx.—The Egyptian sphinx, being symbolic of the combination of intellect, wisdom, and power, is represented with the human head and the lion's body, as shown in Fig. 59; while the Greek sphinx differs in form from that of the Egyptian, as it is usually represented as being of the female sex and possessing wings. This sphinx by the Greeks appears to have been adopted as the personification of malignity combined with mystery, and to her is accredited the practice of propounding riddles to those that visited her and tearing to pieces all that failed to solve them. The gracefulness of the creature's form, however, caused it to become a favorite as an ornamental element, and it is used frequently in mural decoration and for the adornment

of bronze tripods and other devices purely of an ornamental character.



FIG. 89.

82. Centaur. The combination of man and horse, called the **centaur**, was representative of a race of warriors celebrated in Greek mythology for their horsemanship. Their skill was so great that the rider and horse

appeared as one; hence, the development of the idea shown in Fig. 89. A similar device was the combined form of a

woman and a horse, or, more frequently, of a woman and a deer, typifying the huntress, or a denizen of the forest.

83. Medusa.—The head of **Medusa**, shown in Fig. 90, is emblematic and typical of the sensations of extreme fear and terror. According to Greek mythology, Medusa was the most celebrated of the Gorgon sisters, who were originally priestesses of Athena, but having broken her vows of celibacy and ultimately marrying Poseidon, she was punished by the goddess Athena, by having each of her beautiful wavy locks transformed into a venomous serpent, and her head thus assumed the horrible aspect depicted in the illustration.



FIG. 90.

84. License in Designing the Human Figure. Thus, the human figure is seen to have pervaded certain classes of ornamental design throughout all ages, but has been altered or modified in order to suit it to characteristic purposes and places, or its details better arranged to harmonize with other elements of ornament.

The restrictions that influence and largely govern the use of certain ornamental forms in conventionalized design must all be considered of equal importance in the application of the human figure, and a truthful portrayal or realistic rendering is permissible only under the rarest circumstances of absolutely monumental work.



PRACTICAL DESIGN.

PRINCIPLES INVOLVED IN PRACTICAL DESIGN.

1. The principles that are involved in the production of good repeating patterns are *repetition*, *contrast*, and *variety*; *balance*, *symmetry*, and *unity*; *tangential junction*; *radiation* and *proportion*; and *growth*, *stability*, *repose*, and *fitness*.

2. **Repetition.**—Repetition in many respects is the most important principle in textile design, as an all-over repeating pattern implies in itself the idea of repetition, and whereas there are many all-over designs that do not repeat, they are confined to hand work, such as rugs, embroideries, and other products beyond the scope of the designer for the loom or the press.

3. **Alternation.**—In connection with repetition we have **alternation**, wherein the repetition consists of a form that

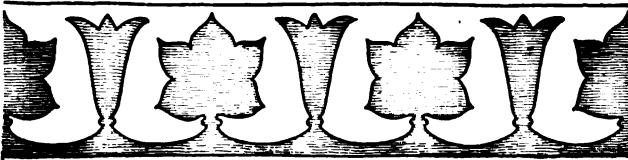


FIG. 1.

duplicates itself alternately with another form, as shown in Fig. 1. Alternation is very useful in some cases when it is

used to vary repetition and avoid monotony. It produces a slight feeling of contrast combined with a feeling of continuous variation, but it must not be confounded with the principles of contrast and variety, which are separate and distinct.

4. Contrast and Variety.—The feeling of contrast is

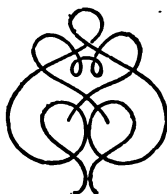


FIG. 2.

best expressed in a design wherein the linear elements meet or cross each other nearly at right angles, as shown in Fig. 2, and contrast is best effected by an arrangement of lines that brings about this condition, as shown in Fig. 3, which is an ancient Greek pattern wherein this principle dominates the entire design, all the

lines being arranged to join each other nearly at right angles.

The feeling of contrast is not confined entirely to designs



FIG. 3.

of a rigid character, and Fig. 4 illustrates an example wherein this principle is carefully handled in a design of a soft and flowing character. At *a* will be observed the main flowing

line broken by the scroll that crosses it at right angles, and, therefore, stands not only in contrast with it but also assists in giving a feeling of variety. **Variety** is the very essence of a design and the principle that gives it brightness and prevents its monotony, and though the variety of design must not be so extensive as to rob it of its feeling of repose, there must be sufficient change to rest the eye from the observation of any particular form.



FIG. 4.

5. Symmetry and Balance.—Symmetry and balance are principles that exist when the arrangement of ornament is such that the details on both sides of a line or point are



FIG. 5.



FIG. 6.

exactly repeated or duplicated, as in Fig. 5, or are of equal value, as in Fig. 6, the former being a symmetrical element, the latter a balanced element.

6. Tangential Junction.—Tangential junction of lines, as we already know, is a detail depending on the close observation of nature, and is illustrated in several forms in Fig. 7. **Radiation** is also a principle that we have

already considered, and whether that radiation takes place from a point or a line is a matter to be decided according to the character of the ornament. **Growth** is another principle derived from observation of plant form, and the curves existing in long slender leaves, such as that of the cattail and flag, or even blades of grass, are expressive of this principle.



FIG. 7.

7. Subordination is a principle that must be introduced into certain parts of a design in order to prevent monotony; there must be principal features and subordinate features, and if every detail is brought into equal prominence there will be neither contrast nor variety. In every good design there should always be a principal feature, such as a bright flower or group of flowers or of leaves, or of some other striking object, and the rest of the design should sink into the background and take a secondary place.

8. Fitness.—The question of fitness is simply the application of a certain class of design to certain materials. Of course, it is evident that the style of design that would be suitable for a carpet would be utterly unsuitable for a printed cotton goods or a velvet, and would be out of place for printing on a fine silk. Then, there is always the consideration of **fashion**—a subject that every designer is bound to be familiar with and governed by, although his good sense may at times be opposed to it; but designs are made for commercial purposes and the designer must bow to the prevailing fashions even though his artistic nature rebel. Therefore, a design should always be thought out or mentally planned at first, and its style, scale, and character suited and fitted to the material and purpose in which it is to be carried out and for which it is to serve.

9. Proportion.—In connection with fitness we come to the principle of **proportion**, which is most difficult to decide upon, as, under it, the designer must make up his mind as to the relation between the lengths and breadths of the repeats, the scale of the pattern, etc.

10. Unity.—The last principle to be considered, perhaps, is **unity**, and in this we must sum up all the previous ones. However well the plan may be balanced and however well the natural formations and growths may be observed and adhered to, and thoroughly adapted though the design may be in scale and proportion to the material in which it is executed, it is of little value unless all these principles unite in a characteristic whole that prevents any one of them becoming unduly prominent or makes it appear that they are not bound together inseparably.

PLANNING THE DESIGN.

11. Characteristic of a Design.—It is always well to have a clear idea of what the main characteristics of a design are to be before the actual work of arrangement is begun. These characteristics will be influenced largely by the material purpose of the finished fabric as well as the trend of the prevailing fashions. If, for instance, the design is to be woven in tapestry or other hanging, then it may be bold and rich, emphasized by the arrangement of strong and contrasting colors. But, on the other hand, if the design is for a dress fabric, it must be made to a much smaller scale and the colors be much more subdued. In the case of a dress fabric, it should always be borne in mind that the scale must be kept down, as some one is going to wear it; and, there being a comparative uniformity in the sizes of various people, we have a definite scale to work to. It has been shown that the most convenient size for a repeat in dress patterns is about $4\frac{1}{2}$ inches, as the folds of the dress and the numerous seams would destroy the effect of the repeat if it were made much larger.

12. Geometrical Basis.—It must always be borne in mind that it is absolutely necessary that the plan of any design that is to be reproduced by mechanical means, such as a printing block, must always have a geometrical basis, and the repeat must be governed by a regular **geometrical figure**. This figure is called the *unit*, and it is the governing shape of the unit of the pattern; it must always be enclosed in itself, or in a multiple of itself, in a square or oblong whose dimensions correspond with the dimensions of the printing block from which the design is to be reproduced.

This may be more clearly understood by reference to Fig. 8 (a), where the unit of the design and the size of

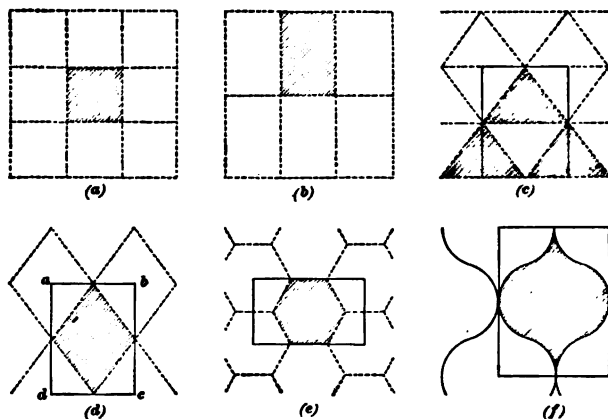


FIG. 8.

the repeat are identical, the small dark square indicating the unit after which the cards would have to be cut in weaving, and the dotted exterior square showing the size of the block from which the pattern would be produced in printing. At (d), however, the lozenge shape contains the unit of the design, and the complete repeat is composed of one whole diamond and four quarters, which together, as shown at *abcd*, are contained in an oblong, this oblong being the repeat for which the cards would be cut in weaving. At (b) is shown the manner in which this oblong would be treated

in a square if it were intended to reproduce the design by printing, the square there representing the printing block; while at (*c*), (*e*), and (*f*) are shown the methods of treating such forms as the triangle, hexagon, and ogee shape, which are considered in the same manner as was the lozenge.

13. Unit and Repeat.—It is important that the student should always keep clearly in his mind the difference between the **unit** of a design and the **repeat**, and not confound one with the other. A comparison of all the details of Fig. 8 will show that the units are always made up of regular geometrical figures that fit together, leaving no interstices between them. This, of course, is a necessary characteristic that the unit must possess. The diamond, the square, and the oblong are the most useful shapes; but on general principles the lozenge or diamond is the best of all.

14. Defective Design.—As said before, it is necessary that a clear and definite idea should be possessed when a design is started, on which the subsequent building up can depend. In Fig. 9 are shown two renderings of the same style of ornament intended for the same purpose, though the one at (*b*) in no way fulfils the conditions.

It is assumed that this is a design for a stripe in some piece of goods, and an irregular wavy line is drawn, from which spring a number of leaves and flowers, regardless of any preconceived order, except that the design must repeat beyond the lines *ab* and *cd*. The line, the leaves, and the flowers have no apparent relation to one another, nor to the border of the panel itself, and the three flowers at *o* accidentally fall together and form a straight line across the stripe, making a very awkward accentuation at the end of each repeat—a characteristic of repeating designs that the designer usually tries to conceal.

15. Remedy for Defects.—At (*a*), however, the same elements are used and show that, by a little consideration.

an arrangement can be obtained whereby the same details may be put together to form a satisfactory repeating pattern. The main stem runs through the ornament in the form of a wave line as before, and the repeating portion is limited between the lines *ef* and *gh* arranged similarly to *ab* and



FIG. 2.

cd of (b). The main stem at the points *k* and *k* is equidistant from each side of the border lines, and the scroll springing from the main stem is drawn in such a way that it will break this stem twice and thereby destroy its monotony.

The flowers are placed on alternate sides and grouped in bunches of three, and a similar grouping, though different in its arrangement, is maintained in relation to the leaves. Close study of the design will show that the leaves and flowers terminate about the same distance from the outside border, and this detail, taken with the evenness of spacing of the wave line, tends to give a solidity and steadiness to

the design and adds to the impression that the floral ornament could not readily be removed without impairing its appearance.

16. The Parent Stem.—In Fig. 10 is shown a surface, or all-over, pattern somewhat of the same character as Fig. 9, the limitations of which are precisely the same as those of the border. The principal line, or the main stem, is drawn first, and once located, the designer must determine whether this line is to form an essential detail of his design or simply to be a starting element. In many cases, the parent stem is inserted into a design solely to give some logical growth and provide some element that the flowers and leaves can spring from, but in no way forms an important part of the design itself, and might be removed without impairing the design in the least. In this case, however, the parent stem is one of the most important factors and must be put in with care and thought.

17. Principal Feature.—In all designs, or at least in nearly all, there should be some feature that by its prominent color, shape, or size is more prominent than the others, and it should be so placed that it will immediately attract the eye. Such being the case, it is necessary that the means by which this attraction to the eye is attained must be considered before the design is started. A design without a leading feature is uninteresting and tiresome, and it naturally follows that if this leading feature is so important, it is necessary that it should be the most beautiful and the most interesting part of the design.

In the present case, the repeat is first decided on and the wave line is carefully studied with the idea that it is to be a prominent detail in the finished design. Its curve must be graceful, of good proportions, and so arranged that it will not interfere inharmoniously with its adjacent curves in the other repeats. The four large leaves in the corner of each repeat being intended for prominent features, should also be carefully drawn and placed in position. In general

practice it would be found advisable to sketch the design in outline at first, as shown in Fig. 10 at (a), because it is likely to be modified after the design is worked out and it would be a waste of time to try and work out the finished details at once.

The next detail in the preparation of the design is the conventional flower in the center of the repeat; this should go in next, and it would seem advisable to place the flower at some point central between the four large leaves. The necessity of placing this flower in a central position can be readily seen by referring to Fig. 11, where the design is the same as that shown in Fig. 10, except that the flower is not



FIG. 10.

in the center but thrown to one side, over one set of the leaves. The effect of this can be readily seen, that inasmuch as the flower is removed from the center, the character of the pattern ceases to be of the all-over type, and resolves itself into a series of stripes. This does not absolutely spoil the design, as it would be considered all right if a striped pattern were wanted; but when an all-over pattern is wanted, this treatment is certainly all wrong. After the flower is

drawn in outline, the rest of the figure is blocked in as shown in Fig. 10 (*b*).

18. Effect of the Repeat.—In all cases in laying out a design, it is advisable to draw more than one repeat, as the student can then judge somewhat better the appear-

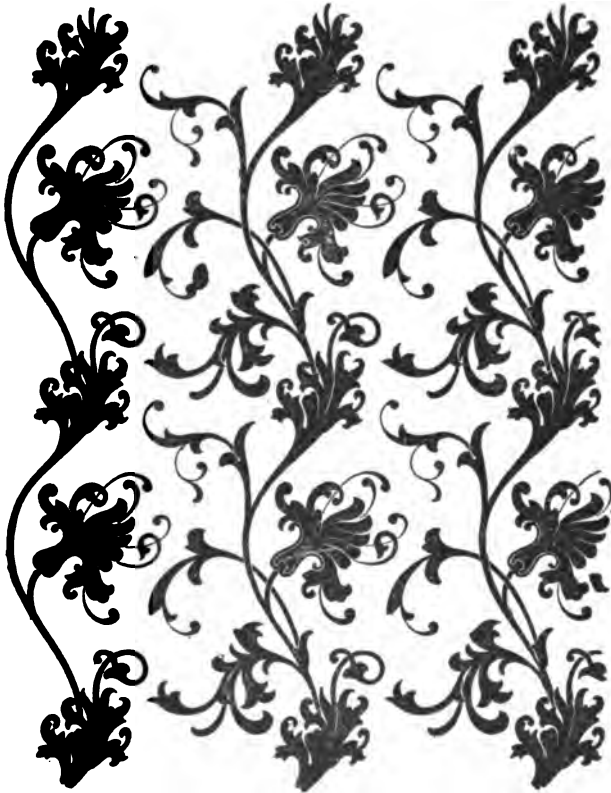


FIG. 11.

ance of it when multiplied in the loom or the press. Few but the most experienced designers can judge the probable effect and know how to avoid faults that are likely to appear, unless several repeats are laid out in each direction.

Having considered the preliminary arrangement of the plan for the repeat itself, we will now take up the different methods of securing this repeat, and consider the advantages of each case.

DROP PATTERN.

19. Unit of the Pattern.—The drop pattern takes its name from a characteristic that requires the unit to be dropped one-half its length in order that adjacent members



FIG. 12.

may properly match, and it has been suggested that the lozenge shape is best adapted as the figure constituting the unit of any pattern. In fact, though this shape is used as

the basis for nearly all repeating diaper patterns, it is almost indispensable in the construction of the drop pattern. Every practical drop pattern, if properly analyzed, will be found with the lozenge as its fundamental form, though, as a rule, this shape is concealed in the superfluity of ornament.

In Fig. 12 the lozenge shape does not appear at all, although it can be easily shown that it is the govern-



FIG. 12.

ing principle of this design. If we join the four central points of the four large five-lobed leaves, the resulting figure is lozenge-shaped, and a similar figure would be produced by joining any four repeating points in the design, as shown in Fig. 13.

20. The Enclosing Rectangle.—Notwithstanding the fact that this lozenge shape is the governing principle of so many designs, it must not be forgotten that the practical working out of the pattern in the loom, or the printing of



FIG. 14.

the pattern in the press, requires that the design *shall be enclosed within a rectangle*, and the amount that has to appear in the design will be one complete lozenge and four quarter-lozenges in order to make up the rectangle. An exception to this rule, however, will be found in center ties and roll carpets, which will be considered later on.

21. Symmetrical Designs.—Where a design is symmetrical on both sides of a given center line, as shown in

Fig. 14, it is only necessary to put half the lozenge on the design paper, as it is possible to arrange the loom to produce two symmetrical halves from one set of pattern cards. For instance, in Fig. 14, the actual amount of design worked out would simply be the rectangle $abcd$, the other half being produced automatically through the arrangement of the loom.

This is also applicable in the weaving of fabrics whose design is not based on the drop pattern, but is of a symmetrical character, as shown in Fig. 15, which is a Gothic design of the sixteenth century, and does not drop in its repeat, the portion $abcd$ being the only



FIG. 15.

part of the design necessary to execute, its duplication and reversing being accomplished when cutting the cards for the loom.

22. Drop Pattern in Carpet Designs.—The drop pattern is most advantageous in its application to roll carpets. Different kinds of carpet are of different widths, but 27 inches is the standard for most styles, and by using a drop pattern it is possible to make the width of the repeat twice this, or 54 inches. This can best be understood by referring to Fig. 16, which is a carpet design in which the drop pattern has been used.

The distance ab represents 27 inches, or one width of the carpet, and the rectangle $abcd$ represents the amount necessary to be worked out in the design in order to cut the jacquards properly, and includes one complete repeat. In the center of the line bc we find the same repeat

dropped at *efgh*, this rectangle representing another width of carpet roll that fits the first so as to make a perfectly connected design. Thus it will be seen that the same points do not repeat in this design in less than twice the width of one roll, as may be seen at *d* and *k*, where

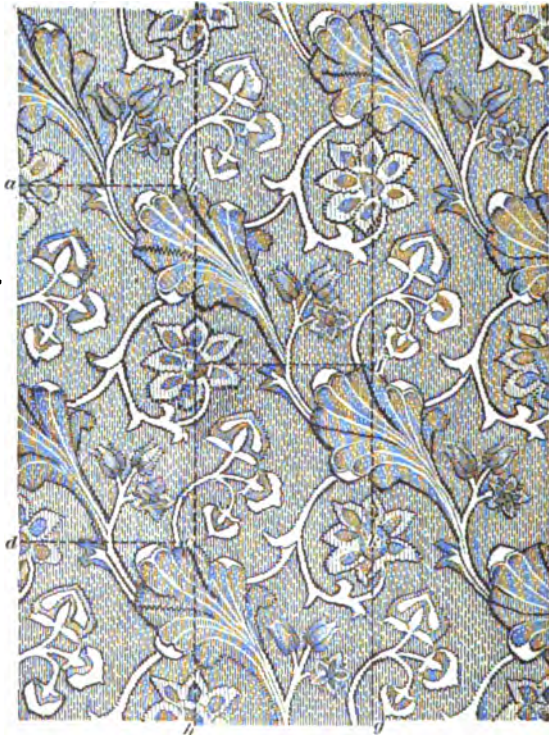


FIG. 16.

the flower at *d* is completed in the section at *k* 54 inches away from it. If the plan were adopted for a side-to-side repeat, these forms would repeat every 27 inches horizontally; but by means of the drop pattern we can, without additional labor or expense, produce a carpet design of apparently twice this width, and this same idea can be carried out in wall paper.

23. Waste in Cutting.—Another advantage in the use of the drop pattern for carpets is that the chance of waste is considerably reduced during the process of cutting and fitting the widths together to suit the size of a room. This can better be understood by referring to Fig. 17, where at (a) the drop pattern is shown as its repeats would recur in a

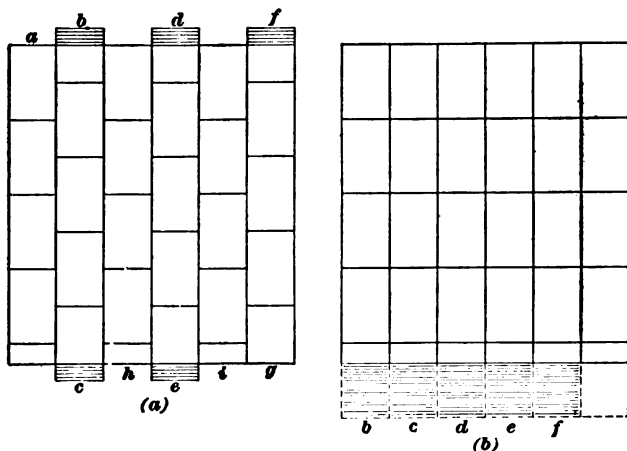


FIG. 17.

room; and at (b) the side-to-side repeating pattern appears as laid out upon the same room. This room is assumed to be 13 ft. 6 in. \times 15 ft., the narrower dimension requiring just six widths of 27-inch carpet to cover it.

It will be seen at (a), that, beginning at the upper left-hand corner and cutting off from the roll what is required for the length of the room, we will have four complete repeats and a little over, and in replacing this width to the right of this and laying off what is required for the second length of the room, there will be a little waste at each end, as shown at *b* and *c*. In the same manner, the same amount of waste occurs at *d* *e* and half as much at *f* *g*, while the breadths between, at *h* and *i*, are cut to exactly cover the room in the same manner as the first one.

Looking now at the other arrangement at (b), we have the

same space carpeted with a pattern that does not drop, but matches from side to side, and it will be readily seen that the waste, as indicated at *b c d e* and *f*, is considerably more than the previous case, amounting to very nearly 4 yards. Of course, the proportions of this room are such as to make this rather an extreme case; but the fact remains that there is less waste with the drop pattern, because the repeats fit at half the height, and the greatest possible waste in any one room length of roll will be half the length of a repeat, while with a side-to-side repeating pattern nearly a whole repeat of waste is possible.

On this account it is advantageous to keep the length of the repeat short whether the design drops or not, for with a long repeat there is much more waste in cutting than where the repeat is moderate. In Fig. 16 the repeat is entirely too long for economy, and had the lozenge form been turned to a horizontal position it would have been much more advantageous, inasmuch as the effort has been in the first place to make the repeat extend over two widths of carpet, and there is no good reason why the repetition in a vertical direction should be of any greater extent.

24. Planning and Drawing the Design.—It is always best to construct the lozenge shape so that its vertical and horizontal dimensions are equal to the vertical and horizontal dimensions of a full repeat, and then to sketch in the principal details and general lines. The leaf forms can then be filled in so that the upper right line of the lozenge will cut these details in exactly the same form and position as the lower left-hand line, and the same may be said of the upper left-hand line and the lower right-hand line. In general practice, the best way of doing this is to sketch the form roughly on transparent paper or tracing cloth, with a soft pencil. These forms may then be gone over with a harder pencil on the reverse side and the pencil markings transferred almost exactly uniform to any part. In the frequent references that we will make to tracing paper hereafter, we

will in all cases mean simply the drawing or tracing of a design on transparent paper and the transferring of the design by means of that tracing to other parts of the drawing. In this way the details of the general sketch may be multiplied and extended freely in every direction. When so multiplied and the forms appear to be well arranged and distributed, an exact drawing can be made by means of tracing paper and everything carefully drawn in its proper place.

25. Striped Effect in Drop Patterns.—In the true drop pattern, the drop is always considered as half the height of the repeat; but it is not unusual to have a drop pattern of less than this, as, for instance, one-third the height of the repeat. This is shown in Fig. 18 at (a), while at (b) the

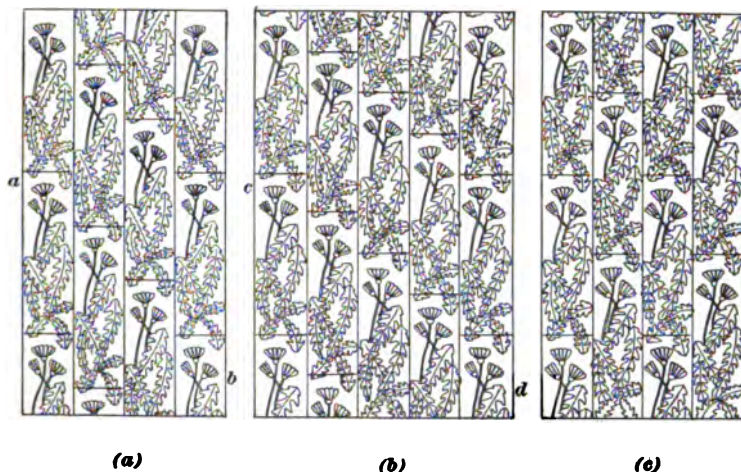


FIG. 18.

drop is only one-quarter of the height; but the result is never as satisfactory, as an even distribution is not so readily acquired and the comparative width of the repeat is greater.

The bringing of the principal elements so much closer together is also likely to produce a striped effect as shown at

ab in Fig. 18 (*a*) and at *cd* in Fig. 18 (*b*); whereas in (*c*), where the drop is half the height of the repeat, there is little or no tendency to get a striped effect, as the principal elements of the design are evenly distributed. The shorter the drop the stronger is the tendency to produce a pronounced stripe and increase the width of the repeat, and, therefore, the more expensive to work out without any compensating advantages regarded of value as ornament. For this reason it should be borne in mind that drop patterns of less than half the repeat are to be avoided if an even distribution of ornament is desired, and the tendency of any part of the ornament to run in stripes is to be obviated.

TURN-OVER METHOD.

26. Advantage of the Turn Over.—Another method of planning a design is called the **turn-over method**, and for many reasons is very desirable. With this method of planning, faults can be avoided with greater certainty and the design is given an appearance of greater complexity, as the repeats alternating to the right and left are less evident to the eye than when running in but one direction. This is a most useful system of planning, and, when properly studied, a design can be executed in which faults are least likely to occur; but the method is a most difficult one for the student to master, because when the unit of one repeat is reversed or turned over, the two units are likely to overlap in some of their details.

27. Planning the Turn Over.—In Fig. 19 is shown a turn-over design, with the geometrical constructions and the main lines on which the whole is based. The first consideration is the proportions of the repeat, shown at *abcd*, containing but 1 unit and 4 quarter-units surrounding it. This constitutes the geometrical construction of our design.

The next consideration is the character of the design itself, and if we assume the ogee outline as shown in this case, we

must divide the top corner of the repeat into four equal parts, at *e*, *f*, *g*, *h*, and draw in the ogee line *fh*, in order to get any degree of accuracy. In fact, all that is required of this line is the portion from *f* to *i*, the other half being traced from it, the two parts being exactly the same. The other four portions may be traced in a similar manner.



FIG. 19.

Next, the large flower in the center of each repeat should be placed in position, and care must be taken that each alternate horizontal series of repeats is turned in a different direction—one whole series toward the right, and another whole series toward the left as shown—as no other arrangement will produce the effect.

In the first blocking out of the design, much time will be saved if the main features are sketched with a single line as shown in Fig. 19, where the oval shape stands for the flower in the center of the unit. When these oval shapes have been repeated a sufficient number of times, the lines of the ogee at *k* should be broken away from their regular direction, and the small flowers in each unit drawn upon these branchings.

28. Elimination of Faults.—By this time the design has been advanced sufficiently to enable the designer to look over it carefully and see that none of its details is likely to overlap or go wrong in any way. It is, however, almost certain that some detail will overlap another when the ornament is first drawn and turned over on the adjacent diamond, and if such overlapping occurs, of course the design must be altered. If, however, the design develops satisfactorily, the detail of the principal element in the center may be repeated in the four corners, at *a*, *b*, *c*, and *d*, and then the flowers distributed along the line *kk* may be sketched in place.

Even now though the design is finished in the last detail, it is wise to look over it thoroughly, as it is almost sure to require some alterations, lest when turned over one portion will come into conflict with another; and the line where the first lozenge joins the four adjacent ones may be so thickly ornamented as to appear heavy, or it may be so sparse that it requires filling. It is always at the points where these units join that the most skill is required in the arrangement.

29. Turn-Over-and-Drop Patterns.—In some of its details the turn-over pattern is not unlike the drop; it requires 1 unit and 4 quarter-units to make up the whole repeat, and the unit contained in the whole lozenge is both turned over and dropped, so that in making the design it is necessary to trace off the first lozenge, reverse the tracing paper, and drop it to the adjacent lower one. In fact, were it not for a

needless lengthening of the name, this style of design could better be termed the **turn-over-and-drop pattern**.

30. Avoidance of Faults.—Turn-over designs are liable to the same faults as are designs that go only in one direction, but not to such a marked degree. This partial avoidance of faulty lining is one of the advantages, as the turning over of the unit causes a zigzag effect rather than a line effect. An illustration of this effect is given in Fig. 20, where at (a) a turn-over pattern is shown based on the wave line, and its unit is indicated by the lozenge shape

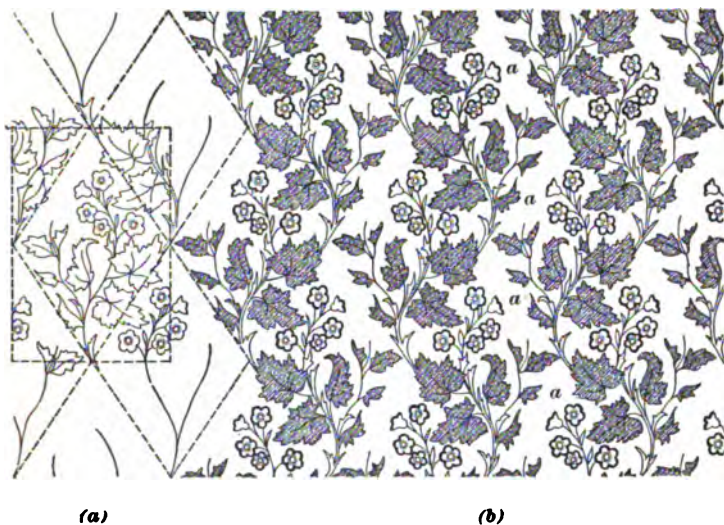


FIG. 20.

in the center. Looking at this rectangular repeat, it would be difficult for even an expert designer to predict that the whole design, when printed and many times repeated, would appear faulty; but this faultiness becomes very evident when the design is executed and a large surface spread out before the eye as shown at (b). If the design shown at (b) be held at arm's length and the eyes half closed, a white zigzag line will be perceived running systematically through the design from top to bottom, as marked at *a a a*, etc.

This could easily have been avoided by the addition of another leaf in each blank, or by twisting around the little spray of conventional buds at the top so that they would fill the gaps. In fact, if the design is worked out enough to present such faults they can usually be easily remedied; but they are very difficult to discern from one or even two or three adjacent repeats.

OTHER METHODS.

31. Advantage of a Knowledge of Numerous Methods.—In order that designs may have a variety and that the work of each designer may not be stamped too much with his personal characteristics, it is necessary that he should be familiar with a number of different ways of planning a design, and whenever he sees the work of another designer he should study the system and analyze the geometrical elements of its construction. Having determined upon the geometrical basis, he should look for the principal spots, and then the secondary features, and the system of connecting them.

32. Systems of Construction.—The choice of geometrical systems of construction on which a plan can be built are very limited, as for mechanical duplication it must be either a square or other rectangle, or some geometrical figure that will exactly fit inside a rectangle, and thereby repeat. The latter condition permits us to arrange a plan that is apparently irregular, provided we can fit all of its repeat within the given rectangle; but care must be exercised under these circumstances to avoid an irregular or unsteady appearance. Thus, it is understood why the square, rectangle, and lozenge shape are the fundamental bases of nearly every design, and the endless variety of every class of repeating ornament that we meet can be traced to a rearrangement of these three simple geometrical figures.

33. Selection of System of Design.—The selection of the system of construction should not be made arbitrarily, but should always be decided after mature thought as to which would bring about the best result. The square produces a repeat in the same distance both vertically and horizontally, and the rectangle gives us a repeat greater in one direction than the other, according to which way it is turned;



FIG. 21.

the lozenge can be made to produce repeats in the same proportion as the square or rectangle, but produces an entirely different effect, as shown in Fig. 21, where the same design is worked out on the system of the square as is worked out on the system of the lozenge in Fig. 22. The former is much more severe than the latter, and the limits of the repeat are much more definitely marked. There is a tendency, too, toward the expression of a horizontal and

vertical system of lining in Fig. 21 that is not so apparent in Fig. 22. It is therefore seen that for some conditions the



FIG. 22.

square might be preferred to the diamond shape, while for other conditions the latter is preferable.

34. Variety Possible.—On these geometrical bases an unlimited variety of designs may be developed from a simple sprig or spray to most elaborate combinations of interlaced wave lines and ogee forms. These may be roughly divided into spots, powderings, connected forms, or stripes, in which the repeats are made continuous by structural lines though the pattern may be made up entirely of geometrical forms.

35. Simple Spot Designs.—In Fig. 23 is shown a spot design, the plan of which is based on the diamond, as is very evident, and shows how valuable an arrangement the

diamond form is to us when much ornament is not a necessity. It should always be borne in mind that ornament is intended to beautify a material, and if the material will look better with very little ornament upon it and plenty of ground or bare space, the designer must confine himself to just so much ornament as the fabric appears to demand.



FIG. 23.

Then, for some purposes, an elaborate design is unsuitable, so that too much ornament will vulgarize and spoil a fabric rather than enhance its beauty. It is in such cases that the spot character of design, as shown in Fig. 23, is most useful, especially when the ground of the material requires only sufficient ornament to break its monotony, or where the material is to be used in small quantities.

36. Influence of Fashions.—The prevailing fashions influence this condition of design to a great extent, especially in regard to wearing apparel. Sometimes the demand is for

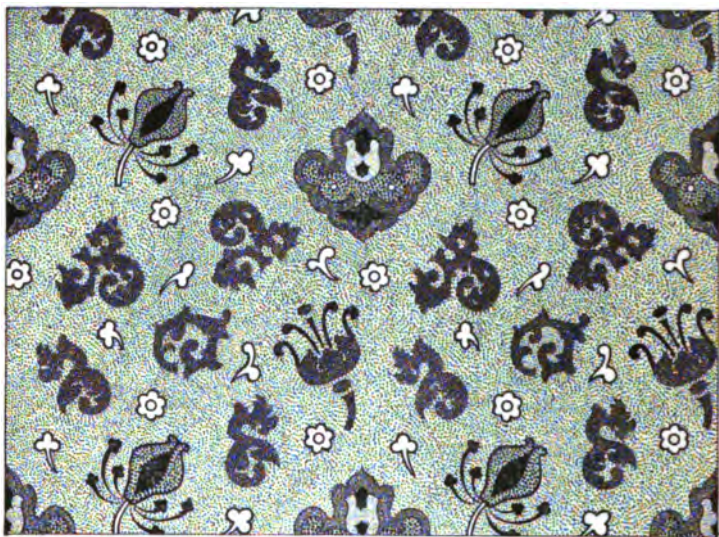


FIG. 24.

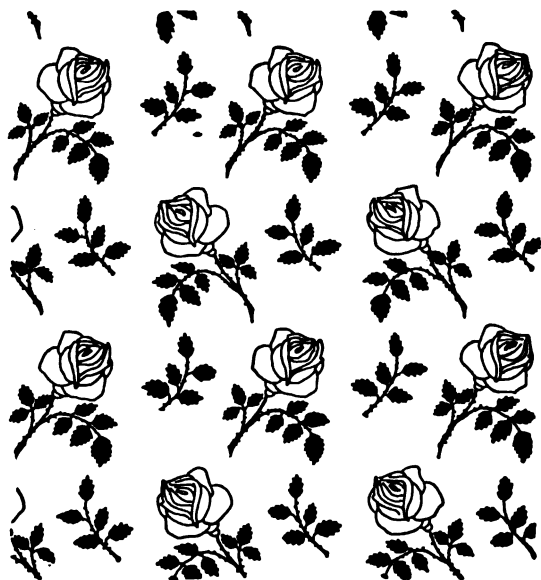


FIG. 25.

spots, sometimes for elaborately figured goods, and sometimes there is an occasion for a medium between the two, as shown in Fig. 24, which is a design based on an elaboration of the spot, but giving a spot and *powdered* effect.

Fig. 25 shows a style of design that is used very largely in dress fabrics; its simple treatment renders it very suitable and to a large extent obviates the danger of faulty lining, and the design is very effective and easy to construct. It is arranged upon the diamond plan, as shown by the dotted lines in Fig. 26, the largest spray being drawn first in any of the unit forms, and then turned over and dropped as before explained. It may, under some conditions, be sufficient to trace simply the four corners of the repeat and then trace in the principal sprig to fill the center of the lozenge shape and occupy any bare space that may appear. Under these circumstances, it is wise to turn the tracing paper back and add the sprig to the larger one and then insert the small sprig in other repeats just as the large sprig was put in at the four corners.

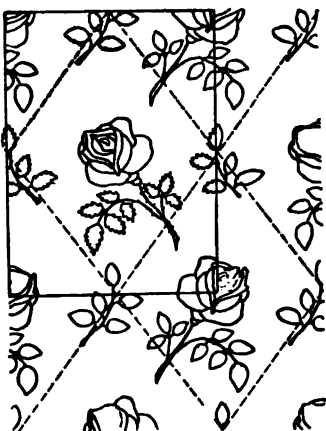


FIG. 26.

Where it is desirous that there should be but little of the ground broken with ornament, a little running vine may be used as the basis of the design, arranged in sprays somewhat as shown in Fig. 27. The construction here is very simple, and though the sprigs run in a lozenge shape, the pattern is constructed upon the system of the square, as shown in Fig. 28.

37. Irregular Units.—A design in which the forms are connected is of much more importance to the designer than a simple sprig pattern such as shown in Figs. 25 and 27.

and is naturally much more intricate to execute. The structural basis of the design shown in Fig. 29 is an irregular lozenge shape different from anything we have heretofore considered, as shown in Fig. 30.

The simplest way of constructing this design is by means of vertical and horizontal lines, the latter drawn at equal

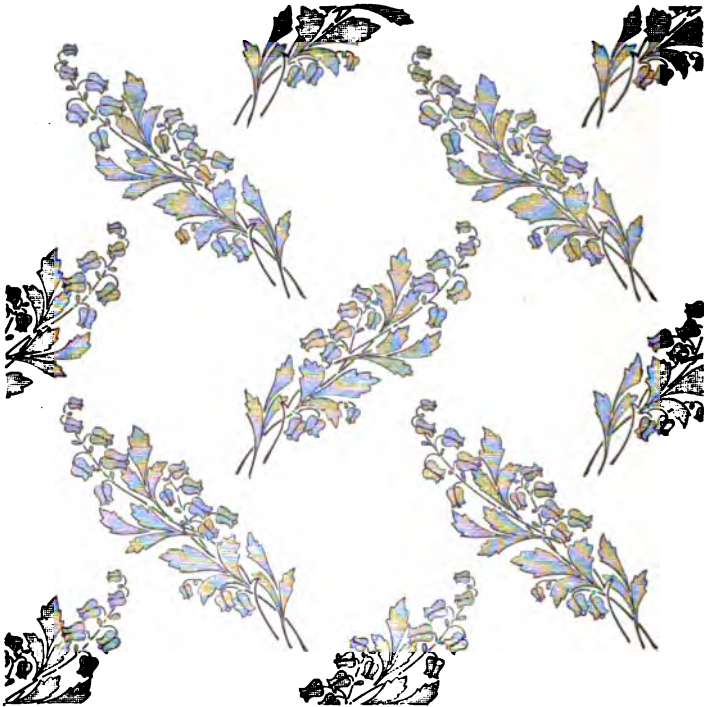


FIG. 27.

distances, as at *abc*, Fig. 30, and the vertical ones alternating with a large and small space as at *dc*, *ef*, etc. The two large flowers may then be placed in the upper corner of a rectangle of the repeat as at *a* and the other large flower at the intersection of the vertical and horizontal line, below this rectangle, as at *h*. The connecting lines and secondary features may then be sketched in and drawn as shown. This

design is a turn-over pattern, and though irregular, it is constructed on the same principles as all turn-over designs, and when completed its principal line is a vertical wave, as may be seen in Fig. 29.

38. A Ball Pattern.—In Fig. 31 is what might be considered a **ball pattern**, as the ball-shaped flower is one

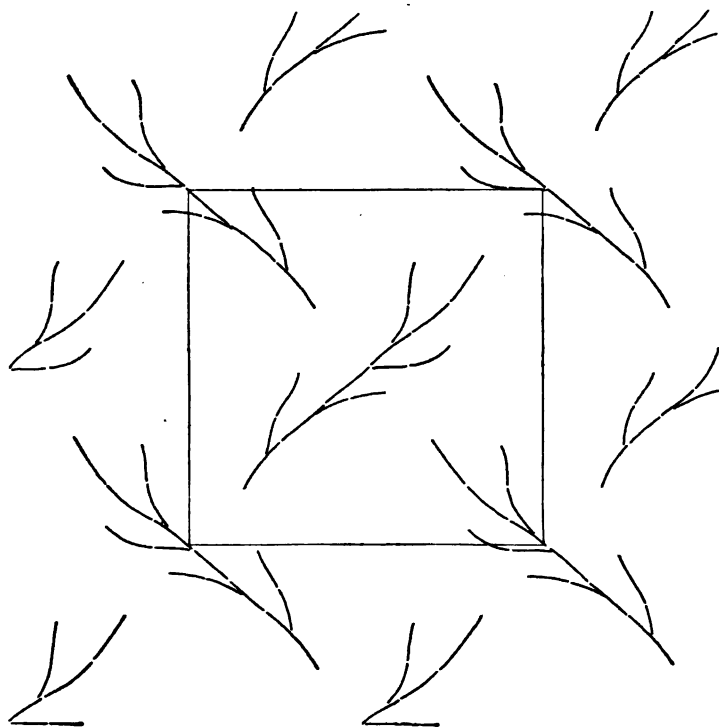


FIG. 28.

of the most prominent features. The design is apparently much more complicated in its effect than it really is. It is a regular turn-over pattern, and where the skeleton outline of the figure is shown it will be observed that there is a continuous flowing stem from which the flowers branch alternately to the right and left. On these branches are arranged



FIG. 29.



FIG. 30.

five clover leaves, and the main feature of the design consists of the arrangement of these flowers and leaves in order to give the impression of simplicity and at the same time produce an all-over effect, without expressing in a pronounced degree the system of its arrangement.

39. In Fig. 32 we have a turn-over pattern on the diamond basis and it conceals the simplicity of its development through the possession of three equally prominent features.

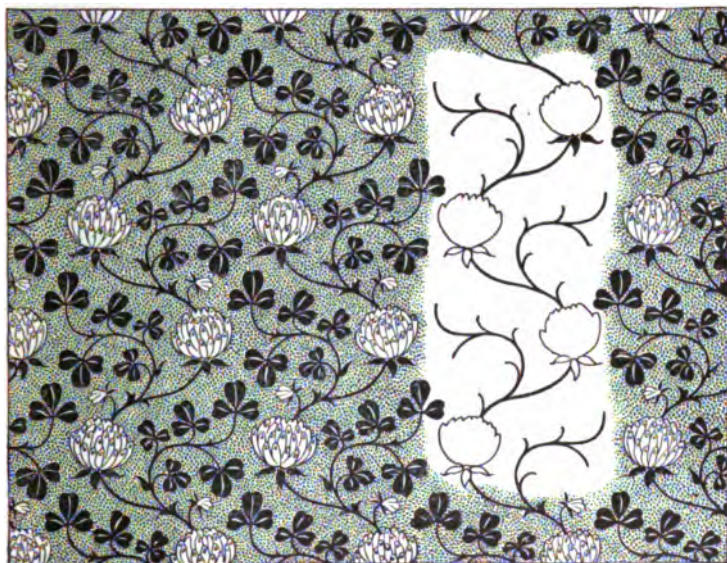


FIG. 31.

The circular flowers, for instance, are arranged on the diamond plan, and the other two features are intersected in a regular order, while the stem oscillates from side to side, sending off alternately to the right and left a scroll with a bud or a blossom. The effect of this treatment, simple though it is, is exceedingly pleasing and expresses the variety that can be attained by the simple geometrical arrangements that underlie it. Simplicity in the arrangement of a design should always be the aim of the designer, as a pleasing effect

can be more easily developed thereby; while complicity alone is never pleasing and is much more difficult to make so.

40. Fig. 33 is a design based on the parallelogram, the corners of which are to be found in the centers of the four similar flowers, while the conventional leaf form is placed in the center. The design is peculiar in the fact that the



FIG. 32.

arrangement of its wave line is such that it runs diagonally across the repeat, making an ogee curve from corner to corner with but one simple curve in each repeat.

41. In Fig. 34 we have a pattern based on the turn-over design characteristic of the eighteenth century style

in Northern Italy. In this design there are two strongly contrasting figures—the spray of flowers and the leaves—and though the plan can be constructed on the diamond, it is far simpler to plan it on horizontal and vertical lines, as shown in Fig. 35. All the leaves that run in the same direction are placed at the four corners of the



FIG. 38

repeat. The design is then traced and turned over on the center, where the leaf extending in the opposite direction is traced in place. Circular forms representing the flowers are then located and the figure arranged to follow its course.

42. Introduction of Geometrical Elements.—The design shown in Fig. 36 is a combination of geometrical interlaced strap work over which are superimposed various foliated forms. The construction is on the basis of the lozenge, and, owing to a duplication of various parts of



FIG. 34.

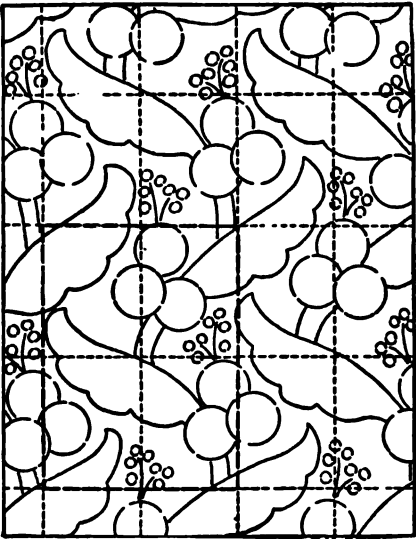


FIG. 35.



FIG. 36.

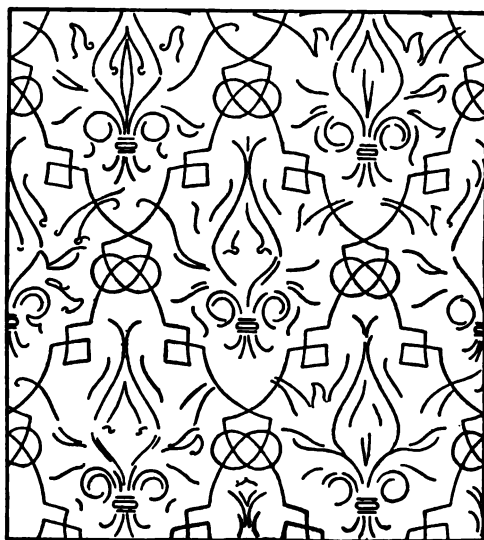


FIG. 37.

the design on each side of a given center line, only one-half of the pattern need be executed for weaving purposes, as it can be adapted to a center tie. This example is particularly interesting in showing the contrast of line, and it will be observed by studying the elements of Fig. 37, which is a skeleton outline of Fig. 36, that when one line crosses another, in nearly every instance it crosses it at a right angle and thereby gives to the design a sharpness and crispness that characterizes it.

43. In Fig. 38 is shown a design based on the diamond and arranged as a center tie. Its principal construction lines are a pair of ogee curves that cross each



FIG. 38.

other, one of which follows the stem of the running vine, and the other forms the governing direction of an ornamental ribbon work that underlies the main decoration. This introduces also a contrast between the ribbon and the design itself that causes the latter to stand up prominently and prevents the whole composition from appearing monotonous.

BORDERS, CORNERS, AND STRIPES.

BORDERS.

44. Uniformity of Repeat.—In woven fabrics it is impossible to consider the design for the border by itself and apart from the filling, as usually when a fabric possesses a border, both the border and the filling are woven together in one piece, and it is essential for mechanical reasons that the repeat of the border should be in line with that of the filling. An example of this would be a stair carpet, which has a border on each side. Then, if the repeat of the filling is 18 inches, the repeat of the border must also be 18 inches, or a divisor of 18, so that the border may repeat twice for every repeat of the filling, or even three times. A repeat of 7 inches in the border would be impracticable, as it would fail to work with the 18-inch repeat of the filling. However, where a border is woven separately and afterwards sewed to the filling, as in carpets, for instance, there is not this same necessity for uniformity of repetition, but there should be, even in a case of this kind, some definite relation between the repeat of the border and that of the filling around which it is to be stitched.

45. One-Piece Borders.—The weaving of borders in direct connection with a falling design is confined to a certain class of goods, such as damask, table linen, tapestry, velvet table covers, cotton quiltings, toilet covers, handkerchiefs, lace, muslin, damask or tapestry curtains, rugs, and carpets woven in one piece, such as Brussels and Kidderminster squares. The presence of a border on any fabric usually implies that it was woven in one piece and that the fabric—such as a table cover—not only possesses the border on the sides but also at each end. Therefore, we must consider, before dealing with the ornamental details of the design of a border, the practical elements that underlie the requirements of their weaving.

46. Size of the Repeat in Damasks.—First, we must consider the size of the article, and in most instances a size that is an even multiple of a quarter of a yard is found to be convenient. Fabrics such as table covers and table linen, or carpets, will always be found to be multiples of a quarter-yard in both length and breadth. For instance, 10 quarter-yards by 7 quarter-yards gives us 7 feet 6 inches by 5 feet

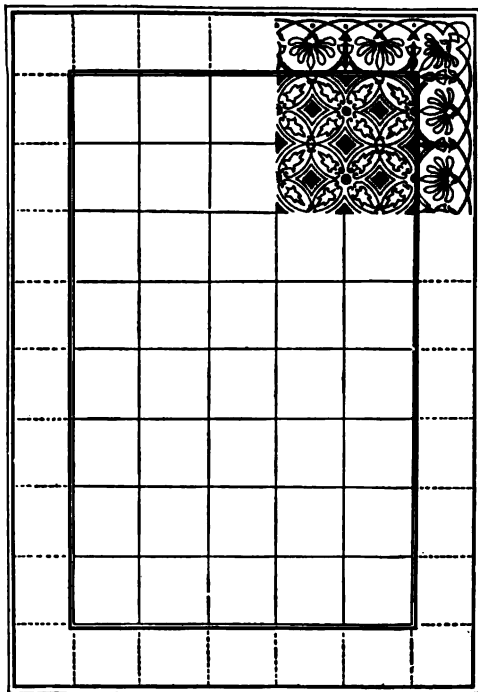


FIG. 39.

3 inches; and take a table cover of these dimensions as shown in Fig. 39 and we have the setting out arrangement of the repeats in which a very highly ornate treatment is given. In this case, the size of the repeat is one-quarter of a yard in each direction. This has the advantage of making the design capable of fitting any size table cover, either in length or breadth, that is desired, simply by increasing the number of repeats.

The border around this, it will be observed, is the same in design and dimension of its repeats both at the sides and at the ends, and it may be readily observed that the secondary repeats of the filling fall directly in line with the repeats of the border not only on the sides and ends but also in the corner.

This 9-inch square repeat is the simplest and least

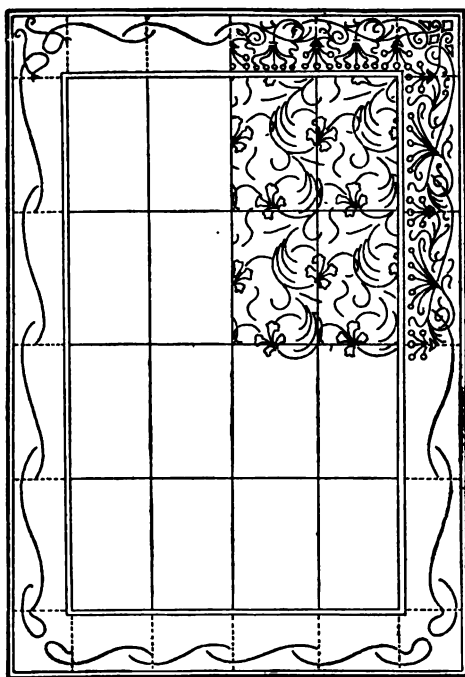


FIG. 40.

expensive way of dealing with a fabric such as a table cloth, and is suitable for some particular designs, but the designer is in no way limited to this shape.

47. Unequal Repeats.—In Fig. 40 is shown another design of identical dimensions with Fig. 39, in which the filling repeat is oblong and the proportion of the oblong is such as to make it similar to the entire oblong surface of the

filling, thereby securing a sense of fitness in the design. This, however, brings us against the proposition of having the repeat of the side borders greater than the repeat of the ends, and the corners are different in shape from the border either at the side or end.

It is the corner of the border of this character that usually requires the most skill in order to make it join properly with

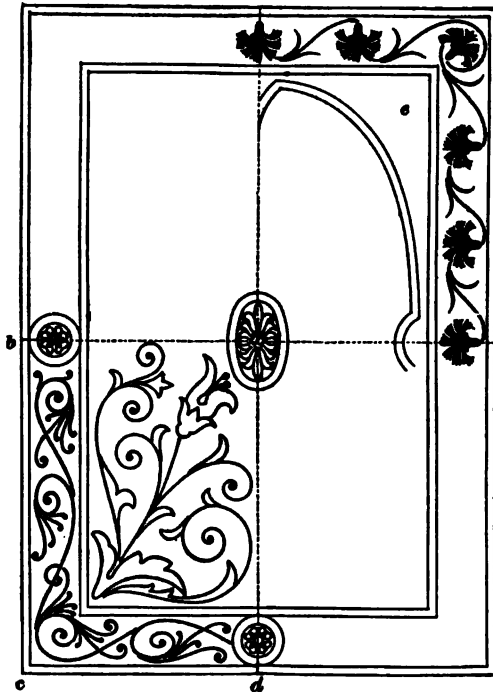


FIG. 41.

the repeat in each direction, while retaining at the same time an identical design in the four corners. This is sometimes obviated by paneling off the corner by itself and introducing here an isolated ornament that has no connection with the border.

When it is desirable, however, that the border should continue around the design without a break, the problem is

a troublesome one unless the design is similar to that shown in Fig. 39, as it is a simple matter to design a corner to fit a system of repeat that is uniform in the two directions. But in running borders such as shown in Figs. 40 and 41, the ornament must have a distinct development in one direction and grow from itself continuously. In some forms of art this is not difficult at all, but in a woven fabric it must be borne in mind that the two side borders must be equal, the top and bottom borders must be equal, and the corners each the same.

48. In Fig. 40 we have a design of a border that is made to connect around the corners without any break, while in Fig. 41 we have at *bc* a design for a border that runs from the center of the width around the corner to the center of the length, where it is stopped by a rosette or other inde-

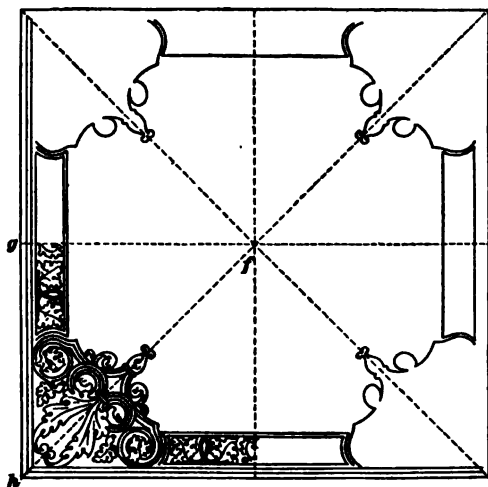


FIG. 42.

pendent device. This system of treatment, however, requires that the repeat of the border and its adjacent filling shall amount to one-quarter of the whole fabric, as shown at *bcdx*, and that whatever comes in this quarter must reverse and repeat above and on the other side; this system also

permits us to treat the angles of the filling with separate ornament, as shown at (*e*) in Fig. 41.

When a fabric is square it is sometimes convenient to duplicate the design on each side of the diagonal line, as shown in Fig. 42, where the square is divided into eight

equal triangular pieces as shown at *fgh*, each of which is symmetrical but reversed from its neighbor.

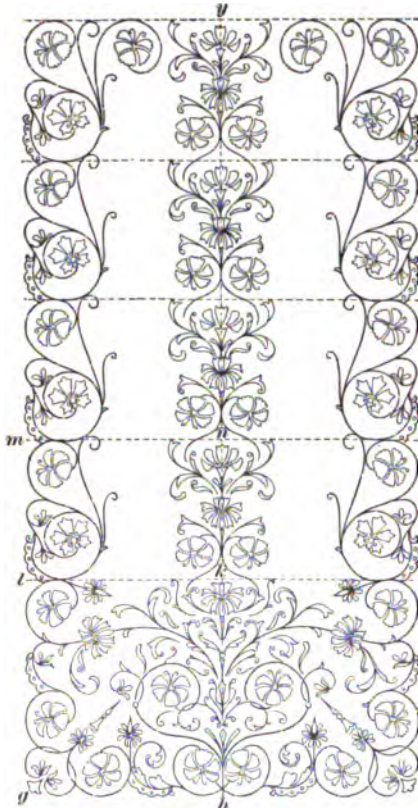


FIG. 43.

49. Lace-Curtain Design. — Where curtains are woven in one piece, one of the most popular schemes of design is to have a dado treatment at the bottom and a border on each of the sides. This border can be of the same width on each side or of varying widths, according to the circumstances, or the design may be such that the two borders and the dado consist of one scheme of ornament varying in width to express the proportion of each.

Much economy can be effected, however, in the designing of curtains by having the whole length worked out upon a symmetrical arrangement so that the two halves each side of the center line will be identical. This may be somewhat severe in style, but is capable of producing the happiest of results. In Fig. 43 is shown a symmetrical arrangement of design

duplicating on the center line y/h . Only one-half of this design would need to be prepared on design paper, $g h k l$



FIG. 44.

being the amount required for the dado, and $k l m n$, the repeat for the border and filling of the body of the curtain; whereas in Fig. 44 just twice this quantity of design

would have to be executed, as the pattern extends the full width of the curtain.

The severity of style which this plan is likely to produce may be somewhat obviated by the use of a free center, shown in Fig. 45, where the design on each side of a given center line is exactly balanced and reproduced. The amount of design worked out on paper in this case is shown at *abcd* in the dado, and *cdef* in the upper portion of the curtain,

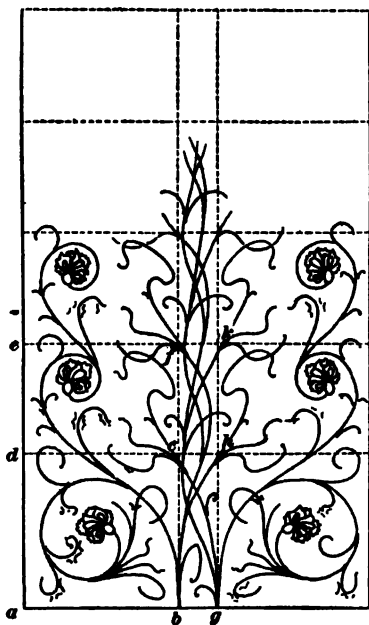


FIG. 45.

and when this is woven, the opposite side is separated from it a distance equal to *bg*, and the free center *bghc* in the dado, and *chkef* for the repeat in the upper part of the curtain would require to be drawn out separately on design paper.

50. Classification of Borders.—We have so far devoted all our attention to the application of border designs to such textile fabrics as they are most generally used, but we will now consider some of the more typical details upon which repeating borders may be constructed. For

the purposes of classification, ordinary repeating borders are termed *link* or *vertebrate*, according to the method by which the repeats are joined, the former being linked together by some conventional form that tends to give the appearance of combining the units, and the latter being built about a straight line that acts as a sort of backbone through the whole design.

In Fig. 46 are shown several borders built up of historic ornament and illustrating the principles of this classification.

It will be noticed that in nearly all of them there is a decided tendency to vertical and horizontal arrangement, that the ornament grows, or appears to grow, at right angles to one of the edges or from both of them. For instance, the Greek border at (a) appears to be perpendicular to the inner edge,

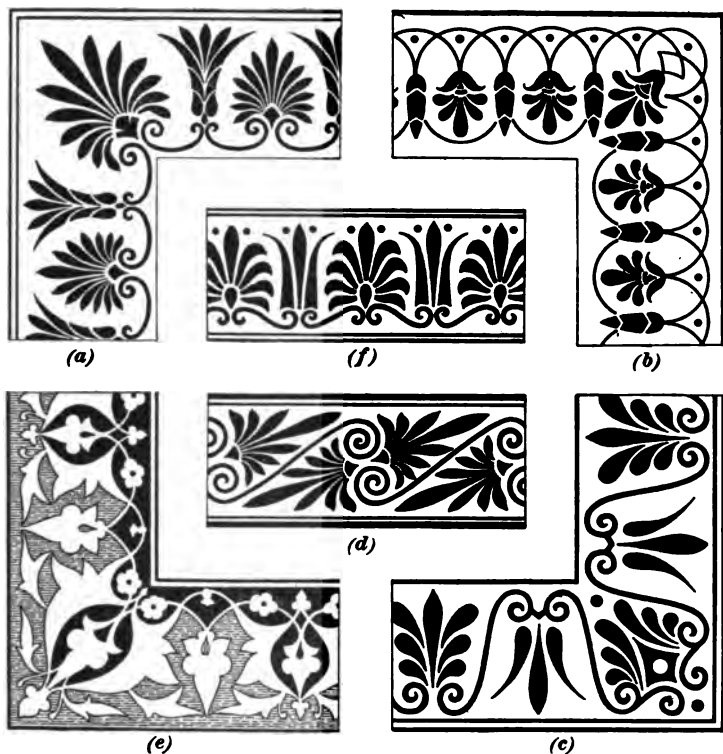


FIG. 46.

while that at (b) is perpendicular to the outer edge, and at (c) is alternately perpendicular to the two edges, each separate element being connected by an S-shaped link. These designs are all Greek in origin and express the handling of border elements typical of the Greek style.

- **51. Borders for Hangings and Table Covers.**—It should always be borne in mind that the position of the

goods or material on which the border is designed must always be considered before the characteristics of the border are decided upon. Table covers and scarfs are usually seen in such a position that the border assumes a perpendicular position in relation to the outer edge, and for such a purpose the design shown at (*b*) would be perfectly suitable. On portiers and other hangings, the lower border is perpendicular to the bottom line, while the side borders could be either perpendicular to the outer or the inner line, and a combination of effect is obtained by using the pattern shown at (*c*), where the border runs all the way around, or the one shown at (*d*), where the border runs up and down the sides and a straight dado is designed across the bottom.

52. Borders for Rugs and Floor Coverings.—Rugs and carpet squares are usually observed from the center of the room, and a border design is most satisfactory when it is perpendicular to the inner edge of the border line, as shown at (*a*) and (*e*), the latter being a design based on Arabian lines. At (*a*) the link is parallel with the direction of the border and turns up at each end to join the ornamental figures that constitute the principal elements of the design. At (*e*) the link consists of a number of semicircles, the ends of which unite every other ornamental detail. At (*f*) it assumes an **S** shape and lies in a horizontal position, while at (*d*) the link travels from one side of the border to the other, as it does also at (*c*), though in the former case each **S** runs in the same direction as its neighbor, and in the latter case they are made to reverse alternately.

53. Vertebrate Borders.—All of the above are link borders, while those shown in Fig. 47 are vertebrate borders. The chief characteristics that we observe in comparing these two figures is that the link border seems more associated with classic art, while the character of the vertebrate border tends more toward the Middle Ages and Renaissance design.

At (*a*) is shown the simplest pattern consisting of a straight line or backbone, with a series of leaves growing



(a)



(b)



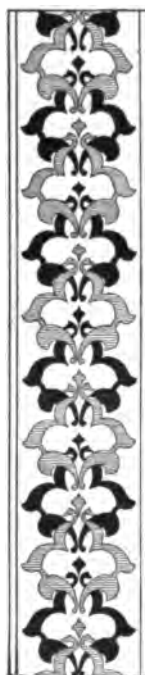
(c)



(d)



(e)



(f)



(g)



(h)

FIG. 42.

symmetrically from each side; at (*b*) the alternate sides are not symmetrical, as the repeats grow alternately above and below the vertebrate lines. At (*c*) one of the boundary lines of the border acts as the vertebrate line from which the details of the ornament spring, while at (*d*) we have both boundary lines acting as vertebræ and the ornament springing alternately from each side. At (*e*) is shown an example of a border based on the wave line, so that it miters well in the corner without a material change in the character of the design. This is based on the principle of a curved vertebra instead of a straight one, as is also the form shown at (*f*), which is a scroll vertebra clothed with conventional foliage, the scroll itself having developed from the wave line. At (*g*) we have the application of the Persian system, where there are two wave lines, each carrying its own share of ornament, in order to fill the space, and while in this example the growth of the two vertebræ is in the same direction, there is no authentic necessity for it, as many designs are known to exist where one appears to grow in one direction and the other in the opposite direction. At (*h*) is shown an Arabian border, the vertebrate line of which does not appear, but exists as an imaginary detail through the center. From each side of this, there branches a conventional figure typical of this style of ornament but printed in two shades, alternating and interlacing with each other, though identical in form. This example of ornament is best suited to a vertical position, for which it was originally intended, while for horizontal positions other designs such as shown at (*d*), (*e*), (*f*), and (*g*) are better adapted.

54. Corners.—In Fig. 48, examples of borders and corners are given that are based on the vertebrate principle but are laid out on less conventional lines. The style of treatment suitable to certain classes of fabric is illustrated in the design of the borders, where the character of the ornament is more suitable to floor coverings than to table covers, or hangings, inasmuch as the former lie flat and display the whole design, while in a table cover, or other

hanging, the corner is usually lost by the folding of the cloth.

It should be borne in mind that the purpose of any angle

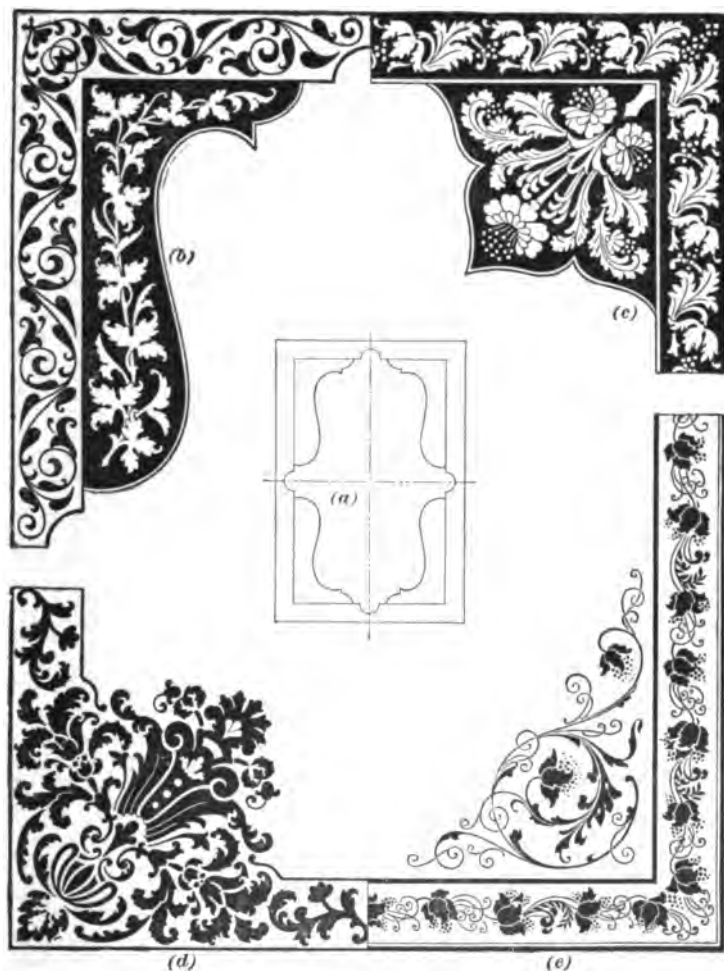


FIG. 48.

ornament is to break the crudeness of a sharp corner, but its form and contour must be consistent so that it leaves a pleasing effect. In the filling at (a) in Fig. 48 is shown the

outline of a rug in which the border and corner design shown at (*b*) is used, and it will be readily seen that the style of corner ornament shown at (*b*) is suitable only to a rug of oblong shape, while the Oriental design shown at (*c*) is better adapted to a rug with a square shape, though of course it could be used in an oblong without any sense of incongruity, whereas the form shown at (*b*) could not be used in a square rug.

At (*d*) is shown a corner design that breaks into the border and causes it to stop abruptly at each side. This design is symmetrical upon the miter line as shown in Fig. 42 and is capable of reproduction on four sides of a square as described in connection with that figure.

One other style of corner design is shown at (*e*) where the border runs around the corner, and repeats itself utterly independent of the corner ornament, and the corner ornament is woven or printed within the border line entirely independent of the border itself. This corner ornament is not enclosed in any definite outline as were (*b*) and (*c*), nor is it symmetrical on the center line as are (*c*) and (*d*). It therefore requires separate consideration in design and requires no calculations for repeat in unison with a repeat of the border.

55. Stripes.—The use of stripes in woven goods, of course, applies almost entirely to the field where a border is considered, or to the goods themselves exclusive of any consideration of corner or border ornament, but the purpose for which the goods are to be used will govern the size, strength, and direction of the stripe entirely. Stripes running vertically tend to increase the appearance of height, while stripes running horizontally tend to decrease the impression of height. It is for this reason that short persons are advised to wear dress goods with stripes running vertically, and in the decoration of rooms with very high ceilings, numerous horizontal lines are introduced to decrease the effect of height.

In Fig. 49 at (*a*) is shown a combination of a stripe and powdered effect consisting of narrow straight stripes from

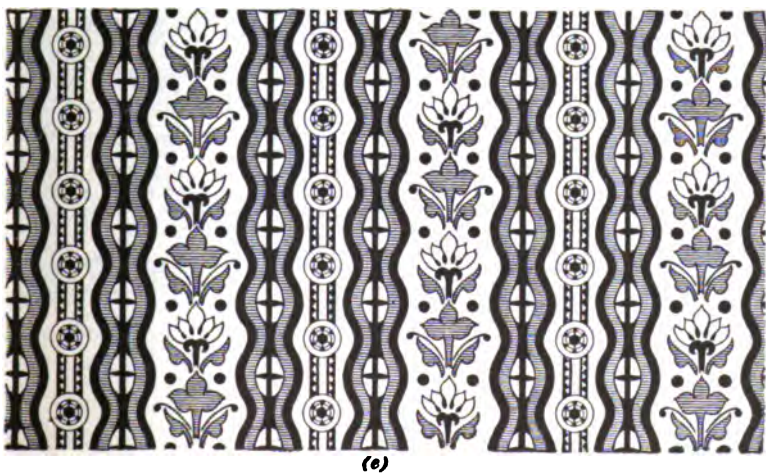
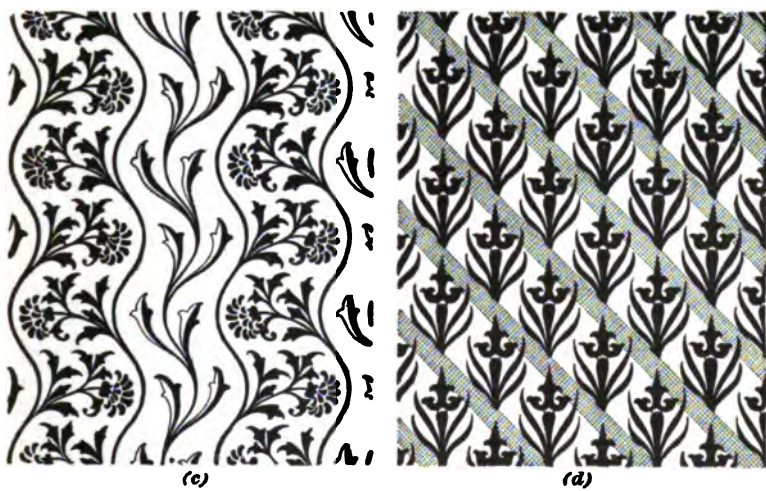
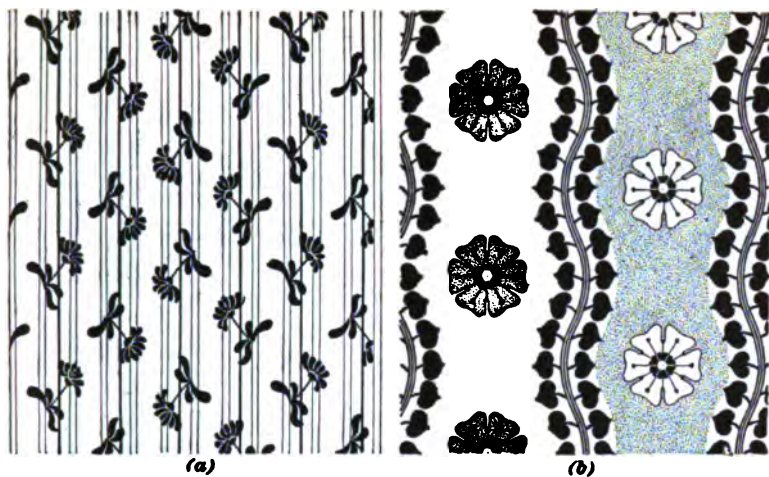


FIG. 49.

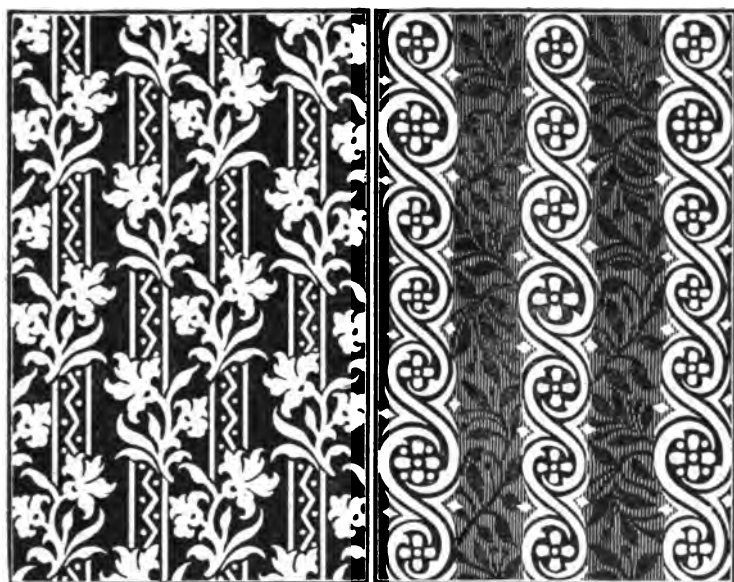
which conventionalized flowers branch at an angle of 45° , changing their direction at each alternate stripe. At (b) the stripe consists of alternate wave lines with conventional flowers growing in the broader spaces on and between them. At (c) parallel wave lines are broken by systematic and conventional ornament that grows from its sides alternately in the same manner as described in the vertebrate border, Fig. 47 (d').

At (d) the stripe crosses the ornament in a diagonal direction at an angle of 45° , and consideration will remind the student that the direction of this stripe is governed by the diagonal of the rectangle representing the repeat. If the repeat were within an oblong, the angle of the stripe could be made greater or less than 45° , according to the proportions of the rectangle. At (e) is shown a more complicated treatment of a striped design wherein three distinct styles of contrasting stripe are used—a conventionalized floral form alternating with a conventionalized geometrical form from which it is separated by a heavy wave-line stripe.

56. Style in Historic Stripes.—In Fig. 50 we have three examples of stripe ornament showing the characteristics of historic styles. At (a) the straight stripe is relieved of its monotony by an all-over pattern of sprigs, four of the sprigs representing the four corners of a rectangular repeat with the fifth sprig in the center. This might be considered a combination of a stripe-and-spot pattern, the style of which is characteristic of the old Italian brocades, this example having been taken from a piece of Italian velvet.

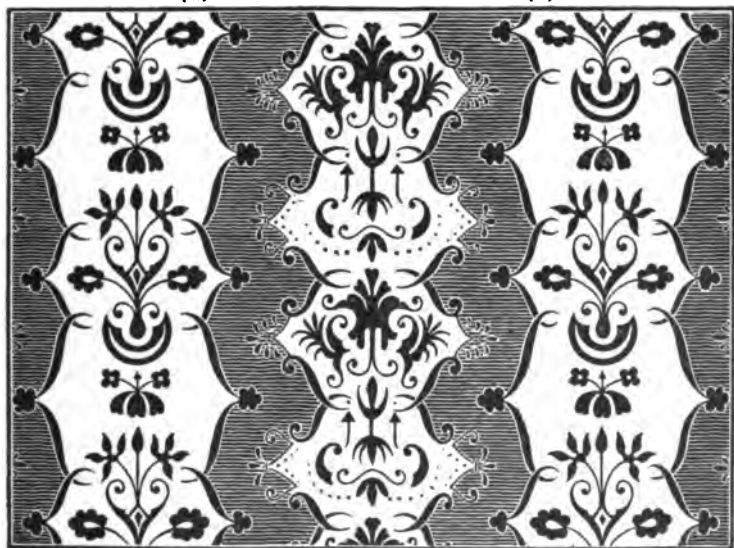
The treatment given at (b) is entirely different from this—a severely conventional design—being alternated with a somewhat naturalistic rendering, thereby giving the effect of a light stripe alternating with a dark one, a style of design characteristic of the early Gothic period.

The pattern shown at (c) is from an old Spanish fabric showing alternate light and dark stripes, each of which heightens the interest of the other and both of which are more or less elaborated with conventional floral designs.



(a)

(b)



(c)

FIG. 50.



APPLIED DESIGN.

(PART 1.)

GEOMETRICAL CONSIDERATIONS.

1. Fitness.—In applying any form of nature to a surface in order to produce a decoration, it must unquestionably possess a quality known as **fitness** for that purpose for which it is required. It is just as important that the decoration should exactly fit the utensil as that the utensil should exactly fit the purpose for which it is made. Mere application of ornament to a space is not decoration, nor is it applied design. It must be adapted to that space as perfectly as possible, and in any respect that it falls short of this perfect adaption, just in that respect does it fall short of being a proper decoration.

2. Influence of Shape.—In Fig. 1 are shown four shapes or forms, and it will require very little study to determine that no two of them could be rationally treated from a decorative standpoint in exactly the same way, and in decorating them the first question that arises is, in what direction should the lines run on the surface that is to be occupied by them.

Here let it be known that the lines forming the boundaries of the figure should influence the direction of the lines laying out the pattern. The leading lines should emphasize the lines of the boundaries, unless for some reason this cannot be done, when the minor lines should be made to do so.

This must all be done with perfect harmony and due care to prevent monotony. Both of these principles can be observed by paying particular attention to the effects of contrast and variety.

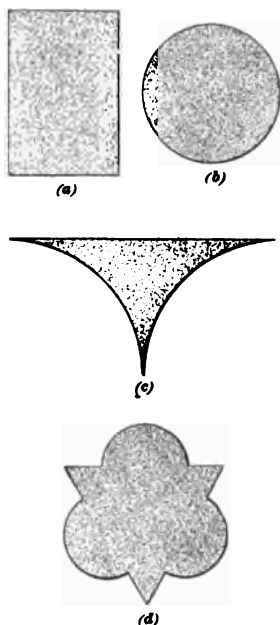


FIG. 1.

3. Influence of Conventionalism.—In determining the directions that are to be taken by the leading lines of our design, it is of the greatest importance that the character the design is to assume should be considered, whether it is to be a purely conventional composition to be based on conventionalism of general ideas, or on the realization of some particular plant. In the first case, we may assume any ornamental lines we choose, so long as they are suitable to their surroundings; but if the design is to realize some particular plant form, the lines must be such that

they depict the growth of the plant and at the same time are suitable to the space they occupy.

This limits our field of selection in the latter case, and we must select our natural types with care, in order that both of its conditions—adaptability of lines and adherence to plant growth—will be carried out. We must not let stiff growing plants be designed in easy flowing lines, nor must we allow the soft trailing aspect of running vines to be stiffened into an unnatural appearance, for such would not be conventionalism, but quite the contrary.

4. Emphasis of Structural Lines.—In Fig. 2 we have the decoration of a surface similar to that shown at (a) of Fig. 1. The first lines put in place here are the vertical ones repeating and emphasizing the effect of the sides of the

oblong, but varying in length. Short horizontal lines are then introduced, emphasizing the top and the bottom of the figure; then the curved lines are brought in for contrast.

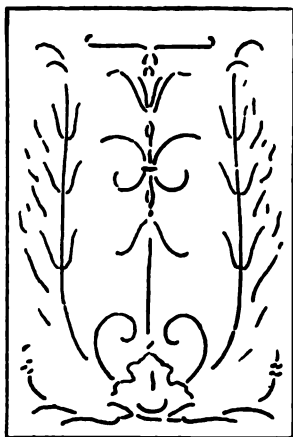


FIG. 2.

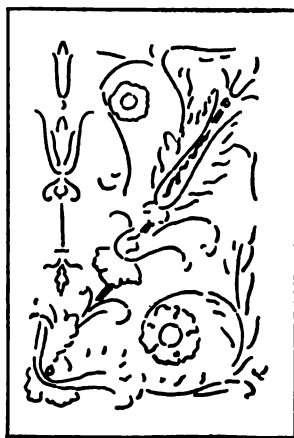


FIG. 3.

If, for any reason, the leading lines of our composition cannot be made to follow the leading lines of the surface that is decorated, our minor lines must be made to do this, as shown in Fig. 3. Here we start with a diagonal line in direct contrast to any of the sides of the rectangle. This contrast is made strong, and variety is obtained by the introduction of the spiral lines; then the short vertical and horizontal lines are introduced as secondary details, to emphasize the sides of the rectangle.

5. Emphasis of Curved Lines.

In Fig. 4 we have the circle, and the same details apply here as in the previous case. A central vertical line stands in strong contrast to a boundary line, while the curved lines are in harmony with it and emphasize the circumference.



FIG. 4.

In Fig. 5 we have a decoration of a spandrel between two arches, based on the outline form shown in Fig. 1 at (c); the arches between which this spandrel is introduced being important features of this construction, the curved lines

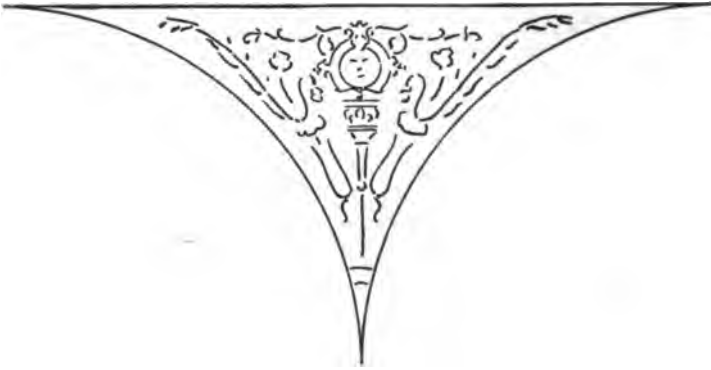


FIG. 5.

forming its boundaries are given more emphasis, while the vertical line separating them is introduced to present contrast.

Then, again, in Fig. 6, which is based on (d) of Fig. 1, the spiral forms and semicircle within the top emphasize the outline of the figure, while both contrast and variety are produced by the flowing lines from the center to the sides.

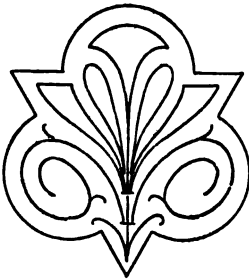


FIG. 6.

6. Harmony of Secondary Lines.—It must be observed, too, that while some of the lines used in laying out the ornament are in accord with the boundary of the surface, the secondary lines must also be

influenced in their direction by the main lines, as shown in Fig. 2, where the small branching lines from the verticals are influenced by the curves in the verticals themselves.

7. Harmony of Lines in Nature.—This principle of harmony and fitness in the direction of lines can readily be studied by the observation of the veining of some leaves. Take, for instance, the lilac leaf shown in Fig. 7, and observe that although in the beginning of their growth the veins start almost in direct contrast to the direction of the edge of the leaf, they gradually bend and assume a curve similar to the marginal outline, and that the secondary veins are in harmony with the primary ones. In order to further secure this harmony and unity in composition, it is necessary that lines should express a continuity in their arrangement as well as a harmony with each other and their surrounding outlines, and although they may be interrupted, a common and united direction should be indicated.

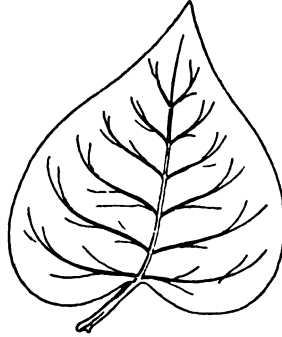


FIG. 7.

8. Continuity of Lines.—It is well that all lines should express the feeling that if they were continued in the same direction or on the same curve from the point where they stop, they would unite with some other line. Thus, in Fig. 8, we have a square panel, the inside of which is laid out on a symmetrical arrangement, and the lines *a* and *b* possess such a curve as would bring them into unity if continued as shown by the dotted line.



FIG. 8.

9. Distribution of Masses.—Another point to be observed is the proper distribution of lines—a distribution

such that the masses between them will bear a pleasing relation to one another. This can also be studied from natural leaf forms. Take, for instance, the ivy leaf shown in Fig. 9,



FIG. 9.

and observe how even is the distribution of the space—that although the veins do not equally divide the surface, they separate it into varying quantities so nicely graduated and balanced that there is an evenness and uniformity of arrangement.

This distribution of masses is materially affected when our design is finished up and we convert the lines of our original decoration into flowing leaf forms and general details, proportioning the surfaces to the surface on which they are applied.

10. The general outline form shown in Fig. 2 suggests the distribution of lines that we desire for the decoration of



(a)



(b)

FIG. 10.

this oblong surface, and the propriety and character of this distribution is expressed much more clearly when our design

is finished upon these lines, as it is in Fig. 10 (*a*). Here we have endeavored to preserve an even and restful balance between the background and the surface figure, securing a distribution of masses that would be materially influenced by any change in the direction of the originally sketched lines in Fig. 2.

Our sketch in Fig. 3, showing another principle in effecting the contrast of lines in order to secure a characteristic decoration in a rectangular panel, when elaborated to the completed form in Fig. 10 (*b*), illustrates clearly the value of properly conceiving this distribution of guide lines in order that the finished design may be carried out without material alteration of the original idea.

11. The value of practice in this direction cannot be too highly estimated, as it is of particular importance in connection with surface designs, whether that surface be a wall, or a floor, or the side of a building, or a portion of the details of some interior decoration, and in Fig. 11 is shown the spandrel

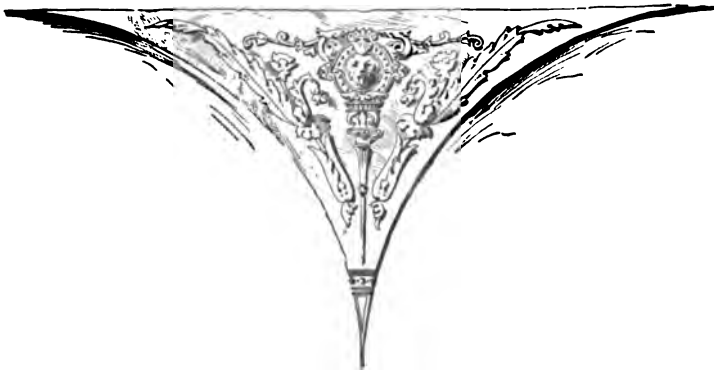


FIG. 11.

of the arch, the outlines of which were sketched in Fig. 5. In working up patterns for an all-over design, it is necessary that the unit of the repeat should be based on the same system of treatment as we have considered in these single forms; otherwise, we will not obtain the satisfactory results that we look for in paper hangings, carpets, dress fabrics, etc.

12. Geometrical Basis of Surface Decorations.—

Wall-paper patterns are laid out on a geometrical basis, and the adoption of different geometrical forms will lead to a great variety of designs in the filling in. In Fig. 12 at (a) is a pattern suited for wall decoration or textile design, where the leading lines are vertical and horizontal, and the repeated

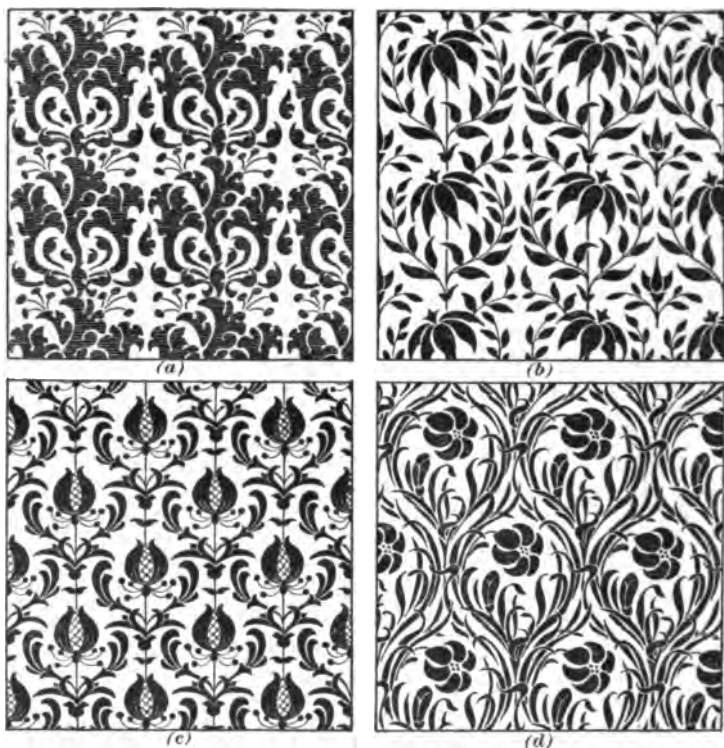


FIG. 12.

ornament consists in the joining of a number of decorated rectangles. At (b) is shown a surface decoration where the foundations of the geometrical construction are tangent circles, yet the pattern is so handled that the lines governing its foundation principle are lost in the appearance of the entire design, and a study of the circular design itself would

show that the leading construction lines were set out in precisely the same manner as in Figs. 2 to 8. At (c) the basis for construction of ornament is the lozenge shape, and this introduces oblique lines giving the pattern an entirely different character from the previous one, while at (d) the structural lines of the pattern being of a wavy or ogival character, give rise to the production of still another variety of surface ornament.

In all of these designs the principal lines are in harmony with the form of the principal figure, and the filling in of the figure is of a secondary consideration, although, of course, it lies with the designer to limit the character of his decoration simply to one figure or to run it into several figures, making the design simple or complex as he desires.

13. Retaining and Abolishing Fundamental Geometric Constructions.—Then, again, the designer may retain the original form on which the design is based and emphasize it, or arrange that it will be abolished altogether when the pattern is completed, adopting his course according to the purpose to which the design is to be applied. As a suggestion, it may be said that if the design is for a wall paper to be used on a dado, the constructive geometrical forms are better retained, as they impart to the design a stiffness and strong look that make it suitable for the purpose; but if the paper is designed to be hung between the dado and the frieze, the structural forms may be judiciously dispensed with and the flowing, easy pattern of the ornament left open that it may be more in harmony with the position it is to occupy.

ARRANGEMENT OF DETAILS.

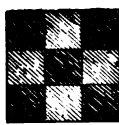
14. A method of evolving patterns upon the basis of intersecting lines has already been shown; the ornament formed on this principle has been analyzed as the basis for new ornament. Starting from here, we will consider the method of treating a surface according to the composition and location of the ornament.



(a)

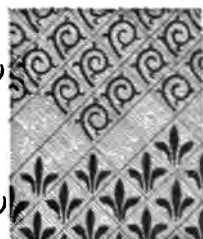


(b)



(c)

(e)



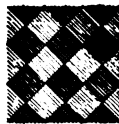
(d)



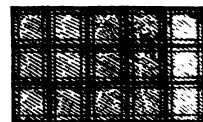
(f)



(g)



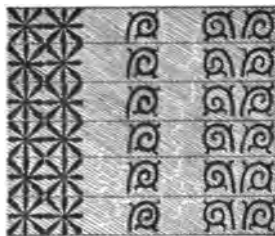
(h)



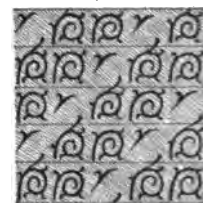
(i)



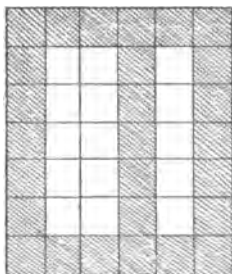
(j)



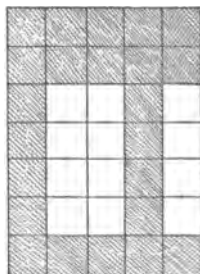
(k)



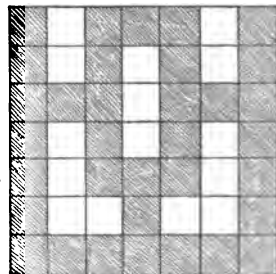
(l)



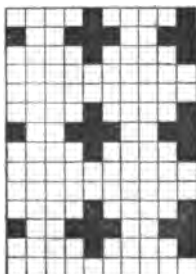
(m)



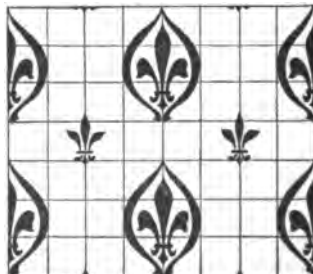
(n)



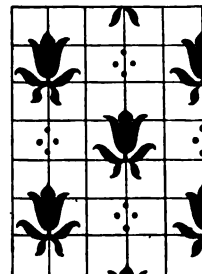
(o)



(p)



(q)



(r)

FIG. 13.

15. General Arrangements of Ornament in Surface Work.—There are five general arrangements of ornament in surface work—*diapering*, *checker*ing, *striping* and *banding*, *paneling*, and *spotting* and *powdering*. Assuming that we have simply a number of square meshes laid out as was our foundation plan in Fig. 21 of *Elements of Ornament*, we can, by simply filling in each square with some form of ornament and repeating the arrangement regularly, obtain the style of treatment, known as **diapering**, shown in Fig. 13, where at (*a*) and (*b*) the square forms are in a horizontal position, and at (*c*), (*d*), and (*h*), they are at an angle, or in other words, a lozenge shape. At (*c*) and (*f*) are shown the same design as is used at (*a*) and (*b*), only the method of laying out the design is to have the ornament occupy only every other square, thereby producing the treatment known as **checker**ing. At (*g*) we have a combination of these two forms, called **checker**ing and **diapering**, wherein the design is made lighter on every alternate square, thus giving a checker effect, while each square is filled with ornament as in the diaper effect.

16. In arranging our ornament in annexed squares, either vertical or horizontal, and leaving spaces of one or more rows of squares between, we get the effect known as **striping** and **banding**, as shown at (*i*), (*j*), and (*k*); or by combining striping and banding in such a manner that the stripes and bands enclose a certain amount of space, we get the treatment called **paneling**, shown at (*l*), (*m*), and (*n*). An extreme treatment of this gives us the effect shown at (*o*), sometimes called **lining**, where the space is divided by lines of different weights converting the surface into a number of small panels like a plaid. By extending the space between the ornaments to a greater or lesser extent, we obtain the effect known as **spotting** and **powdering**, as shown at (*p*), (*q*), and (*r*).

The difference between spotting and powdering simply consists in the relative area occupied by the different pieces of ornament. Where the ornamentation and the background



(a)



(b)



(c)



(d)



(e)



(f)

FIG. 14.

are about of one area, or apparently so, the design is said to be powdered, but where the ornament exists in small masses with considerable space between, the effect is said to be spotted.

17. Diaper.—We will now consider by itself each of these systems of arrangement: First comes the diaper—this consists of a pattern that regularly repeats itself so as to completely cover a surface without interval, or in such a way that any interval that exists will form a part of the pattern. It is what is usually termed an *all-over* pattern—an arrangement of a most systematic character wherein each detail of the pattern is confined to an allotted space and does not overrun its boundaries.

The forms on which the diaper is based may be of any shape, and frequently different forms may be used in the same diaper design alternating with each other both vertically and horizontally. This is shown in Fig. 14 where, at (a) and (b), the geometrical forms governing the diaper are squares and lozenge shapes, and at (c), tangent circles.

18. As the diaper developed historically, the pattern in each geometrical section was permitted to extend over and run into the succeeding section, thereby tending in a slight degree to obliterate the apparent geometric formation as shown at (d) and (e); and, finally, as it developed still more, the boundaries became ornamented as well as the spaces enclosed by them, and the diaper took a form shown at (f). It was then but a short step to the time when the formal all-over pattern developed itself, and arrived at what we consider the ordinary diaper pattern of the present day, which consists of a surface decoration that rarely shows its geometrical construction no matter how regular that construction may be.

In Fig. 15 are shown four designs, at (a), (b), (c), and (d), wherein, after the geometrical guide lines have been removed, it is a difficult matter to trace the character of

the ornament. Each geometrical form shown dotted in these designs contains the complete details of all the orna-

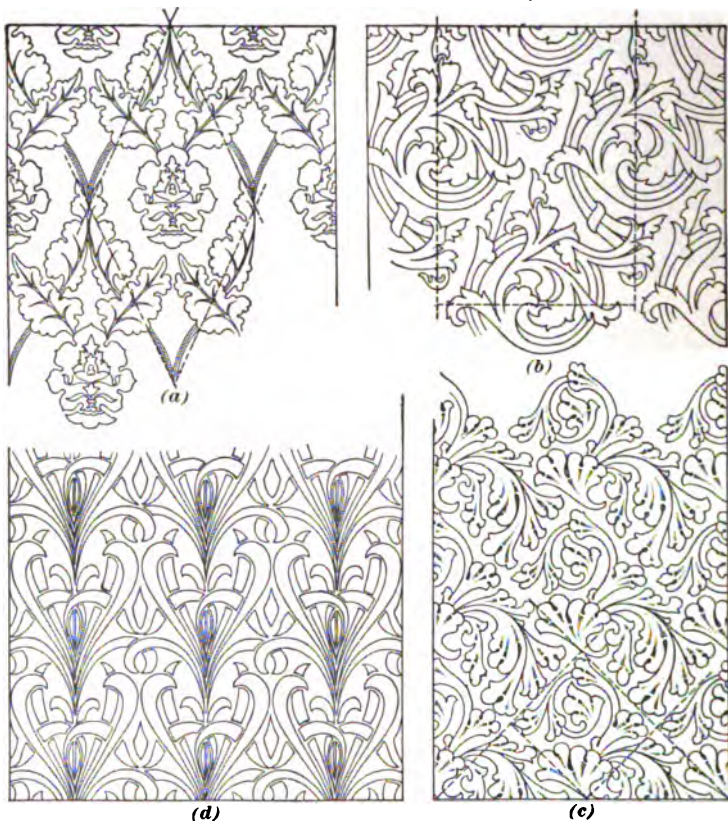


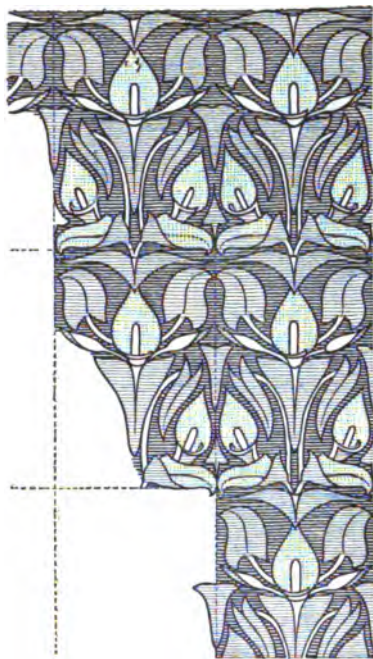
FIG. 15.

ment of the entire surface and they repeat in each direction unlimitedly.

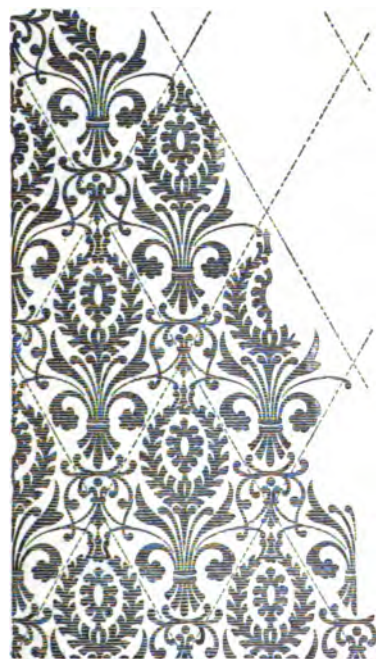
19. Fig. 16 shows additional patterns taken from pieces of tapestry of the thirteenth and fourteenth centuries, whereon the geometrical expression of the design has been emphasized for the purpose of illustration. At (a) the square is the basis on which the design is constructed and contains every detail of the entire pattern, but in two forms, one of



(a)



(b)



(c)



(d)

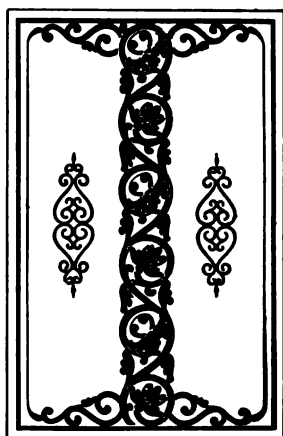
FIG. 1A.



(a)



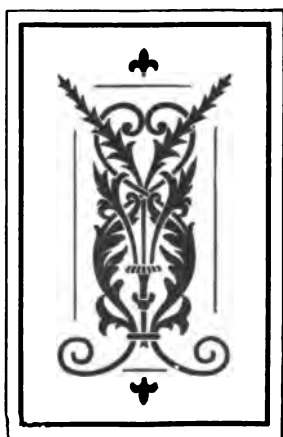
(b)



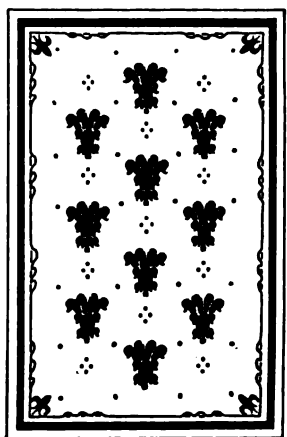
(c)



(d)



(e)



(f)

FIG. 17.

which is the reverse of the other, forming what might be considered a right-and-left pattern, so to speak. At (*b*), however, the rectangle containing all the details of the design is repeated without reverse both above and below and on each side of itself. At (*c*), where the design is based on the lozenge shape, the pattern consists of a simple repetition of the lozenge form in diagonal directions on each of the four sides of its origin, while at (*d*) the general design is based on the circle, and the parts filled in, as well as the parts between the circles, are emphasized in the design and almost obliterate the geometrical basis of the construction. From this it can be seen that the extent to which a system of diapering can be varied is unlimited, and checkering is so similar to it that we can readily see it also has no limitation.

20. Checkering.—In Fig. 17, at (*a*) and (*b*), are shown two systems of surface decoration by means of checker work; at (*a*) the individual lines separating the checkers are omitted from the design and the checker filling alone is used, but at (*b*) the vertical lines of at least a part of the checker work are maintained in the design, and the fillings branch from either side of them in conventionalized floral forms.

21. Striping, Paneling, Banding, Spotting and Powdering.—The effect obtained by striping is shown in Fig. 17 at (*c*), where the broad stripe down the center of the panel is blended into the border to improve the effect, while the space each side is broken by a single spot. At (*d*) the stripes run diagonally across the panel and divide its surface up into a number of bands. At (*e*) is shown the appearance of a panel decorated by spotting alone. Here a large central spot forms a main feature and two smaller spots are placed above and below, the whole being balanced by means of vertical and horizontal lines. At (*f*) is shown the effect in panel work of spotting and powdering, the whole being arranged on a lozenge system of checker work, but destroyed from a checker work effect by the powdered background.

APPLICATION OF ORNAMENT.

HANGING FABRICS.

22. Propriety of Design.—In applying ornament to any surface the greatest consideration must be given to the question of purpose. The style and method of decorating a textile fabric may be very appropriate for itself and altogether inappropriate when applied to a wall sur-

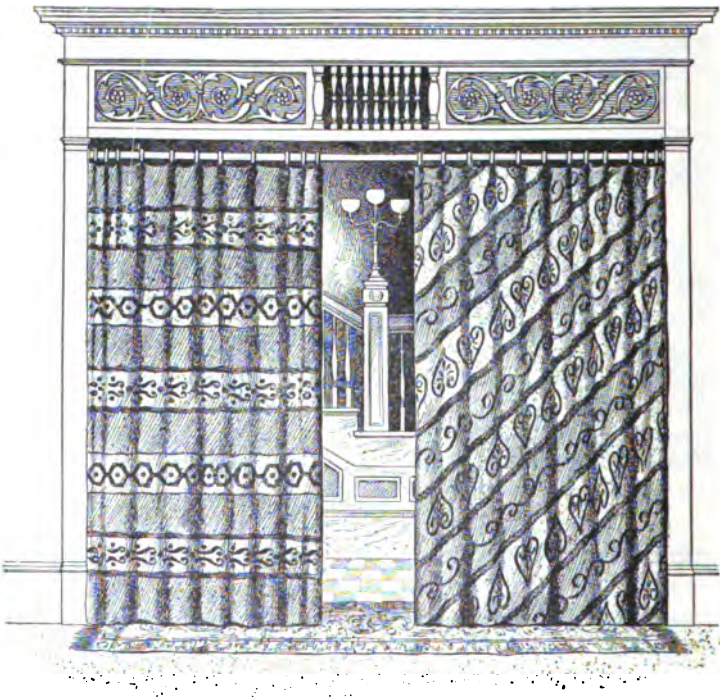


FIG. 18.

face. For instance, even in the same class of goods, a woven fabric that is to be used on a wall surface must necessarily present a different problem in design from one that is to form a hanging over a doorway—one is

stiff, flat, and hard, from the surface it is called upon to cover; the other is soft, movable, and flexible, and uneven in surface when in use; and a design that is suitable for the one would surely be greatly out of place for the other.

23. Here it must again be suggested that the method in the style of design that will best accent the qualities desired in each material will be the method most suitable in constructing the design. The wall must appear flat, and for that reason a design that will not show any particular direction will be more suitable.

Vertical and horizontal stripes must not form any part in the decoration, and a scheme based on diapering or powdering, or an all-over system of paneling, will be allowable.

24. On the other hand, a curtain that is hung from a pole is suitable to striping, and horizontal or oblique stripes work in very naturally for such a purpose, as shown in Fig. 18, as through the folds the stripes are broken and the strongest effect of the movability and softness of the goods is brought out.

Vertically striped patterns are to be avoided as hangings, as their design tends to confusion, emphasizing the folds of the goods instead of harmonizing them, as shown in Fig. 19.

Another point that should be considered in designing hangings is the size of the pattern compared with the weight and quality of the goods—a heavy material that will lie in

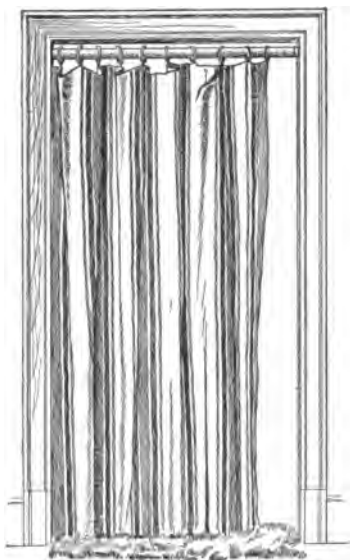


FIG. 19.

bold round folds can support a pattern of large details and vigorous design, but light goods that hang in delicate undulations require a delicate handling in order that the pattern may not appear incongruous or heavy for the goods.

WALL DECORATION.

25. Methods of Treatment.—In the wall decoration of large and important rooms, the figures forming the detail of the decoration may be bold and heavy, but in small rooms of less importance in character the figures of the decoration should be sufficiently reduced not to attract the eye from the other harmonies of the room.

Aside from the scale of the detail of the pattern, there should be considered the order of its distribution, for when we begin to divide a surface into its different sections we must consider the value of each section and the relative importance each is to occupy in the design. For instance, should we divide our wall into dado, wall surface, and frieze, and possibly subdivide these members by moldings and borders, we are emphasizing an idea derived from a structural value—the pedestal, column, and entablature of an architectural order—and the parts having the greatest structural value should, therefore, receive the most severe treatment, while those of less importance may have a delicate and more picturesque treatment. The dado, being the support of the wall surface, must therefore receive the plainest and most dignified decoration, while the wall surface itself may be freely treated with a diaper or spotted decoration, and the frieze, with an elaborate though delicate treatment.

26. Pilaster Forms of Treatment.—Sometimes the wall may be divided by means of pilasters so that it consists of a number of panels; then it loses its character as an entire wall surface, and the panels should be decorated individually, while the pilasters as structural members should receive proper treatment of importance and dignity.

There is a strong objection in some cases to using the pilaster form of treatment as a surface decoration, inasmuch as it has too much of a structural significance, but it is frequently necessary to break the monotony of a long wall surface, and if the actual pilasters cannot be built to bring about the effect, a decorative pilaster may be used with perfect propriety, provided always that it is a conventional representation of one and not a realistic counterfeit. It is in this that the danger of using structural forms in wall decoration exists. The pilaster may, and properly should, suggest the idea of the form of decoration with which we effect the subdivision, but a false and painted pilaster is most assuredly highly out of place as the dividing member.

27. Effects of Vertical and Horizontal Decorating.

It will also be well to remember that the methods of wall decoration have each a marked effect upon the general appearance of a room. Horizontal divisions of the wall increase the effect of comfort and coziness in an apartment but reduce the apparent height of its ceiling, and if the upper and lower divisions of the wall are overdeveloped in order to get this horizontal effect, the cramped position of the intermediate space will reduce the apparent height of the ceiling almost to an exaggeration. On the other hand, vertical divisions of the wall into panels or by means of pilasters, tend to increase the apparent height of the ceiling at the expense of the cozy and home-like appearance of the apartment. Such treatment is permissible only in the more formal rooms of a building, where great dignity and less familiarity of surroundings are required.

28. In the preparation of patterns for wall decoration, whether they are to be stencils, direct paintings, or designs for the paper stainer, weaver, or textile printer, there are always technical matters in each industry that must be considered, besides the mere handling of the design, and the

conditions by which each design is more or less limited must be thoroughly understood by the designer if the artistic element is to be carried to its fullest possibilities.

29. Wall-Paper Design.—Wall papers are printed from blocks or rolls varying in size from 18 to 22 inches square, though most English papers are printed from blocks 21 inches square; and to practically space out a design it requires that the number of fundamental forms or repeats must be so adjusted as to fit one of these blocks; otherwise, perfect repetition in all directions will be impossible. It must also be remembered that no matter whether the pattern is based on the square, the rectangle, or the triangle, the paper will be printed from a square block and in runs of about 12 yards. The block may contain one repeat or more than one repeat or even only a portion of a repeat, according to the scale of the pattern, and in all cases the extension of the repeat in a vertical direction is attained by repeated printings from the block, while the horizontal repeats are matters for the paper hanger to carry out when he places the hangings side by side. The dimensions of the printing block will therefore control, to a large extent, the size and proportion of the pattern, and the pattern must always be so adjusted that the repeat will occur with the utmost accuracy in both directions.

30. Size of the Repeat.—For instance, suppose we adopt the lozenge form as the basis of our pattern, as shown in Fig. 20 at (*a*), and comparing it with the proposed design, discover that it will yield a pattern far too large for the character of the subject we desire to have printed; therefore, we make the block contain one and one-half of the form for repeat as shown at (*b*); but this, while it reduces the scale of our design, at the same time so alters the proportions of our figure that we cannot readily handle it. The arrangement of two lozenge shapes, as at (*c*), in the same space that we originally attempted to put one, as at (*a*), still further decreases the relative proportion between

the width and the height of our geometrical form. Therefore, if it is necessary that our pattern should preserve the same proportion as our lozenge shape in Fig. 20 (a), we must shorten the block somewhat as expressed at (f), or adopt the arrangement shown at (e), which reduces our

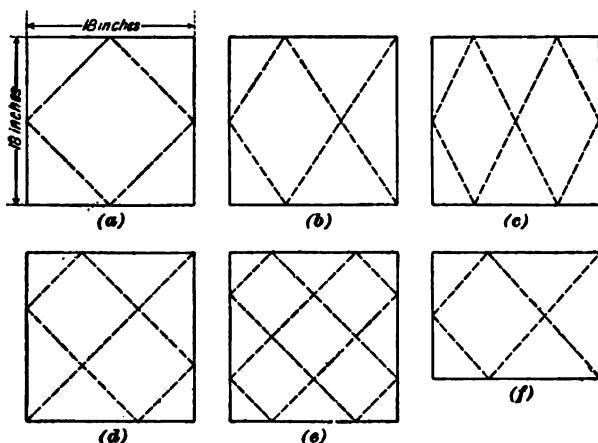


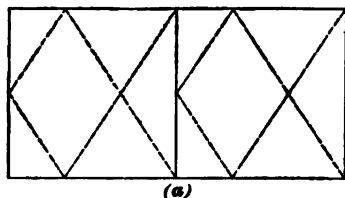
FIG. 20.

repeat to one-half the size we started with at (a), and we can therefore see that in adapting any form to suit a block of a given size we are compelled to alter the proportion or greatly reduce the scale.

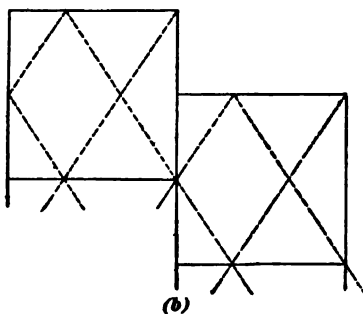
31. If the size of the pattern indicated in Fig. 20 at (b) is satisfactory and if the change of its proportion is of no great account, it will be found that the method of repetition differs from that in (a), (c), and (e) and that it will not repeat by being placed side by side on the same level, as in Fig. 21 at (a), and therefore the horizontal repetition of the pattern must be effected by lowering the pattern half a block when placed side by side as shown at (b). Patterns arranged in this way for hangings are technically known as "drop pattern," because the decorator has to drop the paper half the width of one block when pasting it on the wall. The chief object attained in adopting the drop pattern is the

avoidance of too small a scale, as can be seen in Fig. 20. The largest possible scale that can be worked on this principle, next to the full size shown at (a), is shown at (b), and the arrangement shown at (d), though satisfactory for a

repetition horizontally by dropping the pattern one-third of a block, will not repeat vertically and so *cannot be printed*.



(a)



(b)

FIG. 21.

32. Proportion of the Unit.—Here is the first problem that confronts us in making a repeat pattern. We have in Fig. 20 six schemes of arrangement by which to adapt the form shown at (a) to a different scale of pattern, each of which is likely to present certain unsurmountable disadvantages. The scheme at (b) may be too narrow for the

height according to the work of the design; (c) is still more so; (d) presents us with a smaller pattern than (a) in the same proportion, but one that cannot be printed owing to its lack of vertical repeat; (e) being but half the size of (a) may be too small; and (f), though suitable in every respect for a drop pattern, demands that the proportions of the printing block be changed, which is not a convenient thing to do. We therefore must resort to the printing of our pattern in large scales as at (a), or reduce its proportions to the forms shown at (b) and (e).

33. Bringing this down to a practical basis, we have in Fig. 22 at (a) the diagram of a wall-paper pattern on a basis of geometrical figures and at (b) the method of dropping it in order to secure the satisfactory repeats. This, however,



(a)



FIG. 22.

is not the only method of securing repeating patterns used by designers. The plan of cutting the paper into equal sections after the first elements of the design have been laid out and then transposing the pieces during the process of design, has been heretofore discussed and is certainly more suitable for designs where the treatment is free, such as that shown in Fig. 15 at (b). By this method the artist can work with greater freedom and always be sure of the accuracy of his repeats.

34. Coloring in Wall Paper.—Another detail in the manufacture of wall paper that must always be considered, is the question of color, and the number of colors to be used should always be governed to a certain extent by the scale of the pattern. If the scale be small, several colors may be used, as the diminutiveness of the details will cause the colors to blend and show no effect of brilliant or dark spots, which would appear

in a wall surface where the pattern was large. In a large pattern, however, the colors must be few, or so subdued in tint that none of them is obtrusive.

35. Fitness of Pattern.—In the character of patterns that are suitable for wall papers, the law of fitness should govern us always. The limitations of the processes of printing affect our repetition, but not the growth and development of our design. Patterns that are made up of a conventional repetition of a given type are well adapted to block printing, but patterns having the appearance of a natural growth are but ill suited to this class of work, as the identical lines must occur again and again throughout the decorated space, and the characteristic irregularity of nature is thus violated.

36. The only way to present a naturalistic treatment of a wall surface is by some process that favors the principle of variety. Hand painting is the only means by which ever changing variety may be attained to an unlimited extent. Therefore, the fitness of methods to the realization of the best designs justifies us in saying that conventional patterns are best suited to the mechanically repeated process of printing, and naturalistic designs must always be executed by hand painting.

37. Friezes.—We will now consider the subject of frieze decoration, which bears the same relation to the wall surface as the capital does to the column, or the entablature to an architectural order, and it should be borne in mind that inasmuch as the capital of a column is made more elaborate and interesting than is the shaft itself, just in such proportion should the frieze design of the wall be elaborated over the decoration of the general surface.

It should also be borne in mind that the scheme of decoration of a frieze should be more complicated and interesting than the wall, because it occupies a structural position and also because it is removed beyond a point of danger from damage from moving furniture, etc., but at the same time



(a)



(b)



(c)



(d)

FIG. 28.

its elevated position requires that its decoration should be simple so as to be easily understood at a distance.

38. There are four distinctively different ways in which a frieze may be treated. It may contain a continuous running pattern as shown at (a) in Fig. 23—a system of treatment in accord with the Gothic system of decoration and observable in many of the carved friezes of Gothic art, but unfortunately productive of rather a weak effect when used for plain surface decoration.

A better method is by the introduction of a number of vertical ornaments as shown at (b) somewhat after the clas-

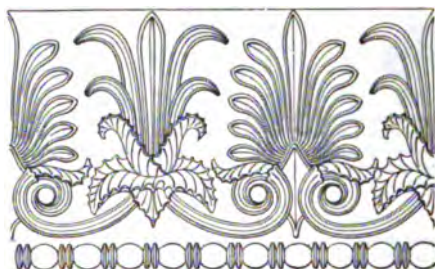


FIG. 24.

sic method of frieze decoration as shown in Fig. 24, which is a portion of a frieze from a Greek temple. Several separate details of this character may be joined by horizontal running ornament, as shown in Fig. 23 at (c), and this we might con-

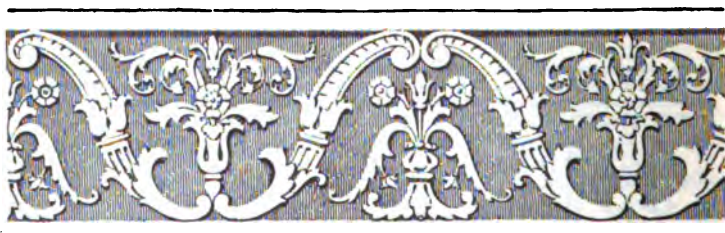


FIG. 25.

sider somewhat more in sympathy with the Renaissance system of treating this detail, as shown in Fig. 25.

The fourth method, shown at (*d*), is by the introduction of a number of panels, but this is only applicable where a severe form of treatment is desired. The system of filling a frieze with a few vertical ornaments is entirely in accord with the structural conditions and recalls the vertical members in the triglyphs of the Doric order, and the dentals in the Ionic and Corinthian.

It makes no difference whether we lay out our frieze by an arrangement of panels or by simple vertical elements, we must bear in mind that it is always wise to accentuate the structural lines, but the extent to which this is permissible depends on the general scheme adopted. If the scheme of design is severe and dignified, structural accentuation may be carried out to a greater degree than if the treatment be light and fanciful.

39. Borders.—Borders are used sometimes in wall decoration to separate the frieze and the dado from the filling or wall space, or are sometimes used as the boundaries of panels. Their primary office in design is usually to prevent the decoration of one surface from lapping over and impinging on that of another; therefore, an elaborate border of complicated design requires a separating element of a plainer character in order to keep its design from mixing with the design of the filling and thereby forming a part of the patterns it is intended to separate. This is sometimes accomplished by making a distinct contrast between the character of the pattern of the border and that of the filling. This may be done in matter of color, or in the arrangement of lines, allowing vertical lines to predominate one, and horizontal lines to form the characteristics of the other.

40. Another use to which the border is put is that of the enclosing of an ornament in order to confine it and give it an expression of unity as illustrated in Fig. 3 of *Elements of Ornament*. In the case of pictures, the application of a border in the form of a frame is to separate it from the more

conventional rendering of the wall surface on which it hangs and confine the attention to that which is enclosed.

41. The treatment of the border depends entirely on the space around it, and the character of the design must be carefully studied in order that the border may not be of more interest than the picture. Occasionally, when the subject does not allow the enclosure a proper border, a simple line around the edge to confine it to its apparently allotted space is sometimes sufficient to satisfy the eye, but this method should be but sparingly used and only when some good reason warrants its adoption.

The character of the border, as said before, must be studied relatively to the design surrounded; for instance, in Fig. 26 is shown a panel of conventional design where at (a)

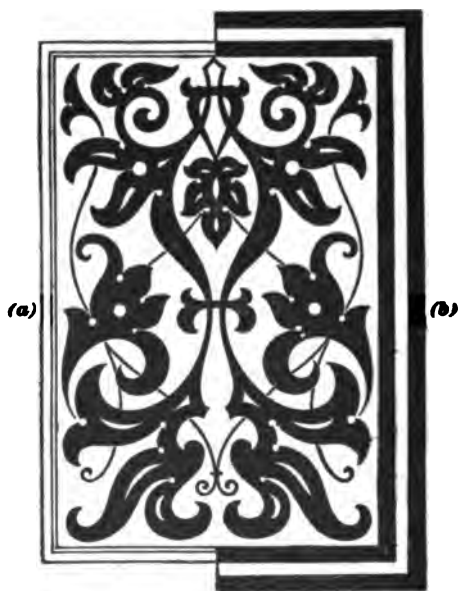


FIG. 26.

the simple line border is readily seen to be insufficient, while at (b) a heavier border is introduced and suits its purpose better. There is no rule that requires the design of a



FIG. 27.

(a)



(b)

FIG. 28.

border to be simply a band around its subject demanding parallel lines, and in Fig. 27 is shown a design where the inside of the border is not parallel with the outside, but consists of a surrounding member of special design to suit its particular purpose.

In Fig. 28 we have at (a) a panel of foliated ornament surrounded by a border composed of details, the interest of which is too great and consequently conflicts with the interest in the panel itself; but at (b) the same foliated ornament is reduced in the border to a conventional rendering, thereby suiting its purpose exactly and enhancing the value of the design instead of detracting from it.

42. Corners.—Besides the consideration of borders, attention should be given to the consideration of corners where borders turn around a frame or wall surface, and it should always be remembered that a frame is structurally formed in one of several ways, the three most prominent of which are shown in Fig. 29, where at (a) we have the

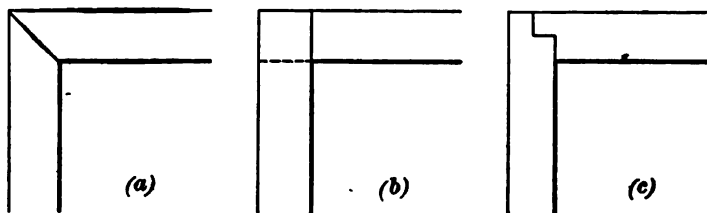


FIG. 29.

miter joint, at (b) a square joint, and at (c) the joggled or halved joint. The joint is always apparently the weakest part of a structure, therefore the ornament should be added in such a way as to apparently strengthen this part of it, and in laying out a design it is advisable to start at the corner and apply the ornament in such a manner that it will appear to hold the corner in position and extend itself over the vertical and horizontal pieces.

43. Pilasters.—Besides horizontal borders, there are vertical elements that fulfil the same functions, and under

this consideration may be included the decorative elements of pilasters and other upright divisions of a wall surface.

Many lines used for horizontal borders have often been used in the decoration of pilasters, subject to certain modifications in order to adapt them; but this course is not to be commended, as there are four systems of pilaster decoration that seem to have satisfied the wants of mankind in the best periods of art without any general modification or improvement.

44. In one of these the elements of the design are built in stages and symmetrically disposed around a central stalk as shown in Fig. 30 at (a). This method gives us the

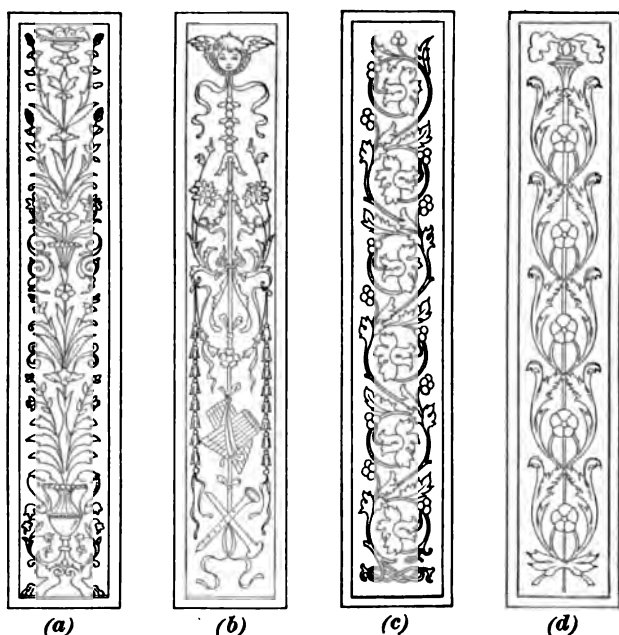


FIG. 30.

impression of support and vertical feeling of stability characteristic of the pilaster itself. The second method is where the ornament is tied together in bunches apparently and suspended over the surface of the panel of the pilaster by a

cord or ribbon as shown at (*b*), and this treatment should be used only when the pilaster itself is of vigorous design and requires no element to apparently strengthen its ability to support. A third method is arranged upon a succession of spirals growing apparently in vine form from the bottom of the pilaster or panel and neither adding to nor detracting from its value as a structural member, as shown at (*c*). The fourth method, shown at (*d*), is similar in effect to the first, and is based on a series of wave lines crossing and recrossing a central stem without in any way adding to its apparent support.

45. In the treatment of these, designs (*a*) and (*d*), being additions to the development of structural feeling, will require a conventional rendering of their details. The central axis must be strong, and architectural elements can be used in the subdivisions. On the other hand, the light delicate treatment of (*b*) and (*c*) will permit of a naturalistic rendering, and grape-vine, ivy, or morning-glory patterns, never suitable to the other surroundings, may form the type on which the design is based.

CEILING DECORATION.

46. In every room there are two surfaces that require consideration in connection with the architecture and decorative treatment; these are the ceiling and the floor. The first of these is usually the least decorated part of any apartment, though in many historic buildings the conditions are quite the reverse.

47. In decorating the ceiling it should always be remembered that this detail of a room acts as a reflector of light and should therefore be treated in such a manner that its ornamentation will not render the apartment gloomy, and particularly if the ceiling is low. It should certainly be in harmony, both in design and color, with other details of the room and particularly with the frieze or cornice with which it is surrounded. Its design may consist of the most simple treatment, limited to a border, with ornaments at the

corners to strengthen them; or it may consist of a number of structural lines covering the whole surface, particularly if a structural treatment is given the frieze. This may be understood somewhat by referring to Fig. 31, which shows a

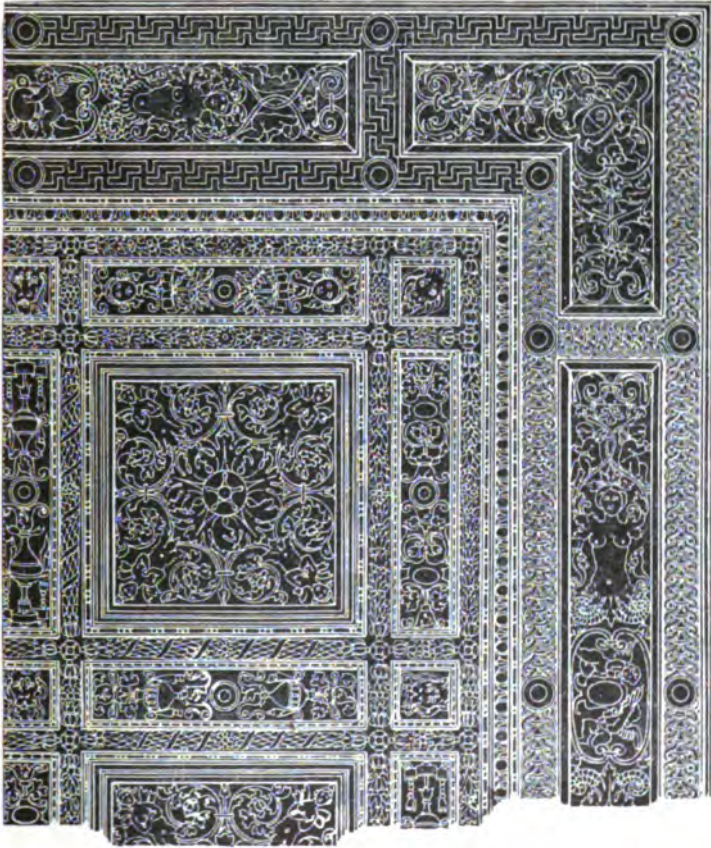


FIG. 31.

structural arrangement of a ceiling resulting in panels of irregular sizes and shapes, each of which forms a subject for individual decoration according to its value in relation to the others. This was the usual treatment accorded the French buildings in the beginning of the nineteenth century.

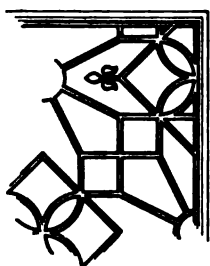


FIG. 32.

In Fig. 32 is shown a corner of a ceiling in the style that prevailed largely during the Elizabethan period—a development of the elaborate tracery of Gothic days, relieved with spotted ornaments; while Fig. 33 shows a design for all-over treatment suitable for a wall-paper pattern that can be mounted on the ceiling as other patterns are on the side walls.

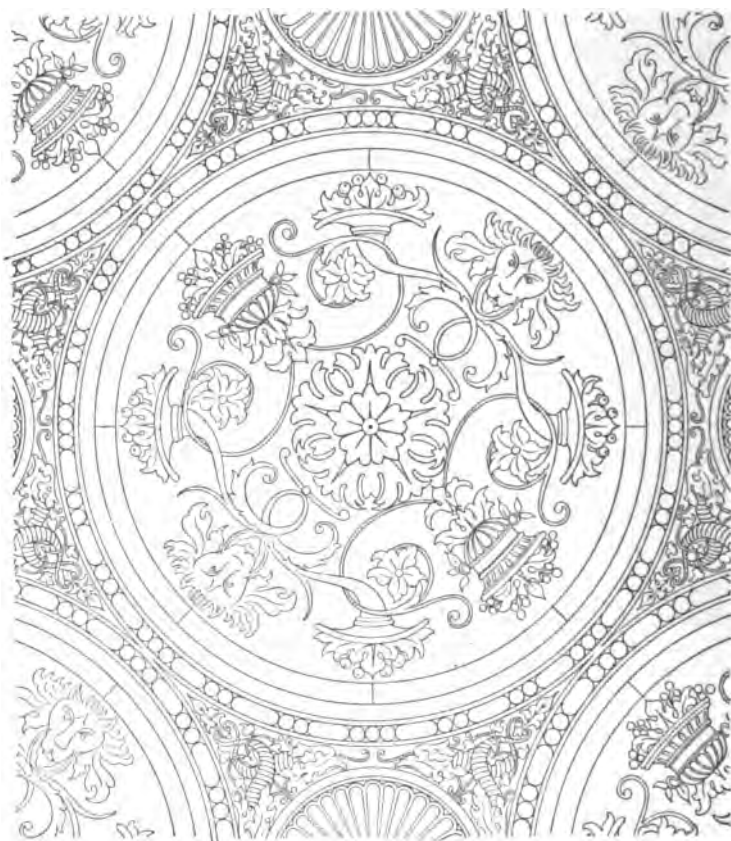


FIG. 33.

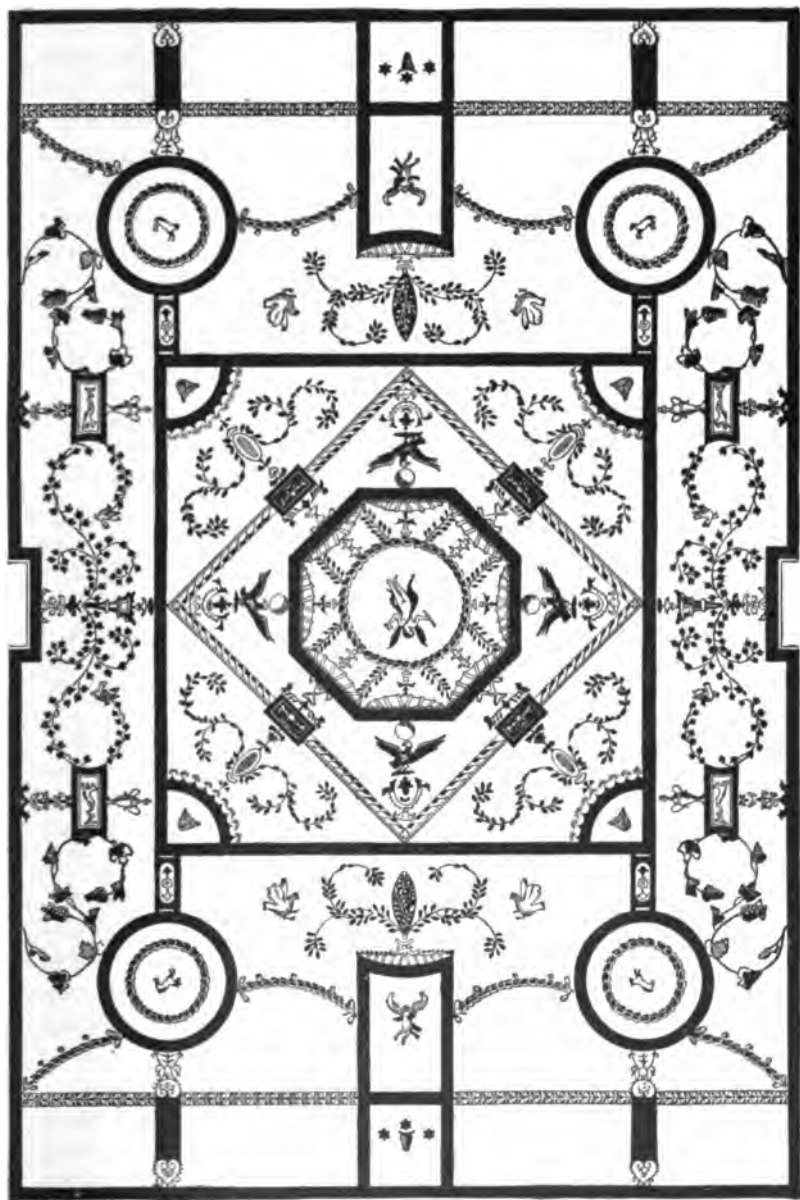


FIG. 34.

48. Adaptability of Decoration.—Care must be taken to suit the general decoration to the purposes of the room and the character of its surroundings in each case, and where a room is small and the intention is to have it cosy and comfortable, a mild, delicate treatment of ceiling will be found the most satisfactory; but, in large halls and assembly rooms, a ceiling can be elaborated with more interesting subjects, as there will be a number of points from which it can be studied. This was the method of treating the Pompeian ceilings, as shown in Fig. 34.

49. It should also be mentioned that all ceilings are not flat—some are arched, some are domed, and some have preserved the natural conditions by the insertion of paneling between the beams. The decorative treatment of each of these must be considered according to its case.

Flat ornament must not be applied to curved surfaces, as it is likely to appear distorted, and the decorative details that are suited for long narrow panels, in the depths of which illumination will be poor, are certainly not suited to broad, open wall space. With domed and arched ceilings, the character of the ornament should tend to vertical elements where the ceiling joins the side walls, and gradually shape itself to horizontal elements as it rounds overhead, each of these blending into the other to preserve unity in the design.

FLOOR DECORATION.

50. Necessity of Flatness.—In covering the floors of an apartment, no matter what the material is to be, it should always be borne in mind that the prime element to be considered is that of the flatness of surface. It is proper that a ceiling should be paneled, domed, or vaulted; that a side wall should consist of pilasters and framed pictures, of projecting and overhanging entablatures, or be supported upon a continuous dado; but under all conditions the floor is flat and any decoration that tends to interfere with this flatness is out of place, and wrong.

The general practice of designing floor coverings to have the appearance of an uneven surface is found more in carpets than in tiles or parquetry, but this mistake will be found in all materials. This can best be expressed by a few illustrations.

For instance, in Fig. 35, at (a) is shown a simple border pattern for parquetry, wherein the design appears to possess an interlaced effect of one strap passing over and then under

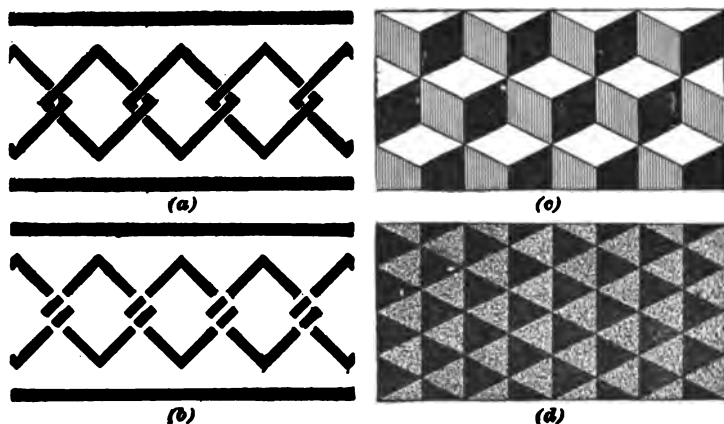
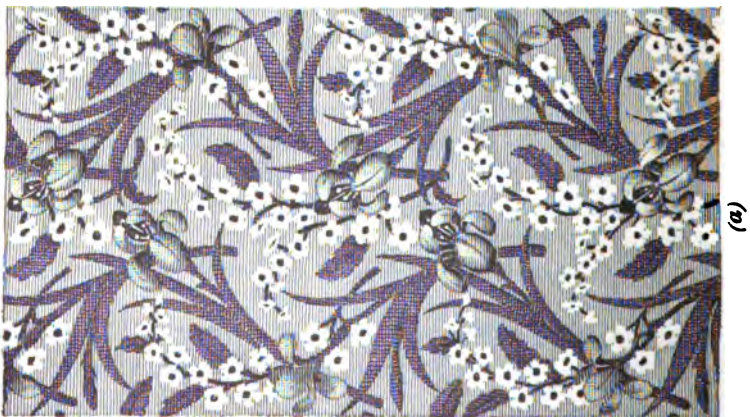


FIG. 35.

another, which, if true, would make the floor uneven and therefore undesirable. A better method of treating this on the same lines is shown at (b), where the flatness of feeling is preserved.

The same may be said of the tile-work pattern shown at (c), wherein the arrangement of lozenge-shaped tiles is such that it gives one the impression of a series of cubes standing on their corners, which certainly is most undesirable. A better treatment is shown at (d).

51. Softness of Outline.—In carpet designs, the patterns usually take a less rigid form than in tile work, mosaic, etc., because the nature of the material is such that, besides the expression of flatness, consideration must be



(a)



(b)



(c)

FIG. 86.

given to the flexibility of its character. Carpet usually possesses a soft and somewhat yielding surface and it is therefore proper that patterns woven in it should be made up largely of curved lines that are more expressive of softness and flexibility than are straight lines—symbolic of firmness and strength.

Great contrast in a carpet design is undesirable, because it is expressive of hardness and firmness, at variance with the character of the material. For instance, in Fig. 36 at (*a*) the appearance of the design is uneven and there is too great a contrast between the tones of color used. The treatment at (*b*) is better and gives a flatter appearance, but the outlining of the pattern has increased the contrast of the general ground. At (*c*), however, the tones are brought nearer together and the entire appearance is flat and soft, so that the pattern and the ground melt and blend into each other in a harmonious manner entirely suitable to the material and its purpose.

UTENSILS AND VASES.

52. Origin.—All objects that are products of industrial art have evolved by successive developments from some simple form that was originally constructed to serve a utilitarian purpose only. The most elaborate forms of cups, vases, furniture, jewelry, etc. each have a most elementary origin, and various alterations, for reasons of convenience, have been forced upon them, in accordance with the constantly altering conditions of society.

Take, for instance, a cup; this vessel has its origin in the desire of prehistoric man to provide himself with some vessel of capacity in which to collect water to drink and for other purposes. The earliest cups and bowls were doubtless natural ones, consisting probably of gourds, shells, horns of animals, etc., and these crude implements satisfied man's requirements until a more cultivated period of society was attained, and we find man manufacturing utensils of clay. Nothing was more natural than that he should imitate in clay the same forms and shapes to which he had been

accustomed in nature, and we find the earliest vases and vessels modeled on a form of the gourd, shell, drinking horn, etc.

53. The earliest form of a vessel used for catching water from a spring would naturally be a wide-mouthed bowl on the sides of which were provided handles for holding it, as shown in Fig. 37; but, although this is well conceived for receiving dripping water, it is poorly adapted to the carrying of it, because the least motion would cause the water to spill, it having so large a surface, and for carrying purposes a narrow-mouthed vessel was far superior.



FIG. 37.

Both conditions, however—that of receiving the water, and that of carrying it—had to be provided for, and we thus arrive at a vessel designed to suit the double purpose in the form shown in Fig. 38. Here the wide mouth is still retained, while the under part is narrowed down in order to present a small surface of water to be affected by the oscillation of the body in walking, thereby reducing the chance of spilling. In this simple necessity we arrive at the first form of vase, with its large body, narrow neck, and expanding top, and we find that its origin was due to necessity and not to fancy.



FIG. 38.

54. Development of the Drinking Cup.—Now, let us turn for a moment to the ordinary drinking cup that we find in various forms. In Fig. 39 at (a) is shown a form of cup that is common even at the present day and undoubtedly had its origin in the section of some animal's horn, and it is this form of cup that has received the greatest development throughout successive ages of history.

Although this horn shape is decidedly serviceable in use, it had a tendency to be easily overturned when filled with liquid, and at the same time there was danger of its slipping through the fingers when the exterior was wet, and a change

in shape naturally resulted. The first of these difficulties was overcome by expanding the base somewhat, in order to give it a greater standing area, as shown at (*b*), while the slipping tendency was counteracted by an alteration of the

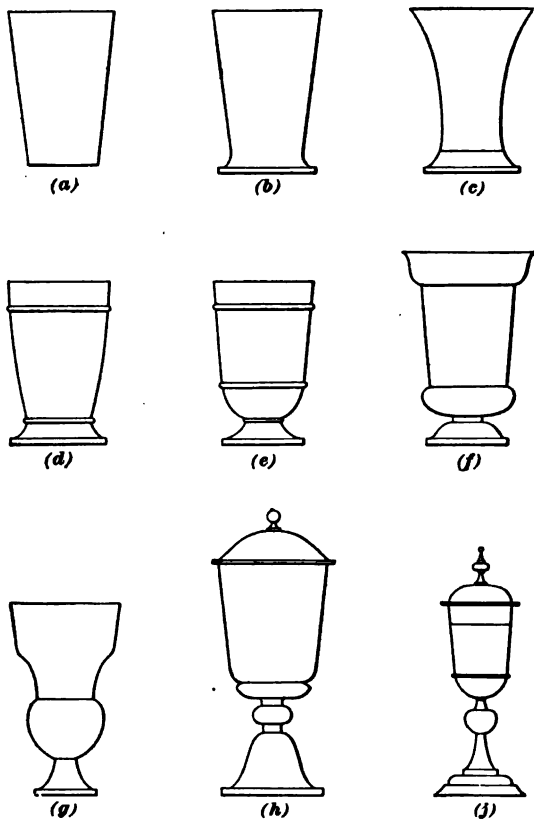


FIG. 38.

outline as shown at (*c*), or by means of raised rings as shown at (*d*). The gathering of the part below these rings brings us to the form shown at (*e*) and introduces us to the first idea of a stem below the glass.

55. The parts of the cup then assumed specified names, the extreme top being termed the lip, the lower part the

body, the portion between the body and the stem was called the calyx, and then came the stem and the foot.

The next development was on the principle of extension of individual parts: first, the development of the calyx, so that it was emphasized beyond the body of the cup, as shown at (*f*) and (*g*); then the decoration of the frieze below the lip became a feature, and, subsequently, for the purpose of keeping out dust, etc., a cover was added, as shown at (*h*).

56. The term *hanap* is usually applied to those vessels with covers to distinguish them from the open ones, and when such vessels were made of large size—so large, in fact, that they could not be handled without great inconvenience—it became necessary to elongate the stem in order that it might be grasped entirely around by the hand, or else to add on one or two sides of the cup a handle. To distinguish these two, it was necessary to call the large glass with a stem a *hanap*, while the one that was lifted by means of a side handle was termed a *tankard*.

The introduction of the long stem brought as a necessity of construction another detail, the *knop*, which is a ball or protuberance in the middle of the stem to keep it from slipping through the hand, as shown at (*j*) of Fig. 39, and the stem was extended so that it was necessary to add a finial or knob on the center of the cover, in order to preserve the line of balance and apparent stability of a cup.

57. As luxury became more general, drinking vessels became elaborately ornate and engraved and were regarded more as articles indicative of wealth than for actual use. The enrichment of the surface of the hanaps was usually produced by three general methods, all of which are dependent, for their effect, on the contour they bring about. The first method is to add variety to the outline, the second method to develop individual parts, and the third method to subdivide the surface.

The alteration in outline arose largely through the influence of the nature of the material used and the method of

working. The precious metals, owing to their ductility, were worked to a great thinness, and, consequently, became so light as to be particularly flimsy; to resist the damage the surface was likely to undergo from indentation, the sides were usually bulged and beaten into various regular forms in order to give them strength. This method of working was soon adopted as a decorative feature.

58. Another method of strengthening the stem that became a source of ornamentation was the adding of small cast supports and braces at different parts of the stem, it being believed that these would add stiffness to the whole. They were, in the first place, adopted to overcome the tendency of interior pressure on the vessel and to strengthen the junction of the calyx and stem, and they not only gave support to the vessel but added a very pleasing effect and suggested undoubtedly to the mind of some subsequent worker the possibilities of an extended application.

59. Development of the Vase.—The development of what is modernly known as the **vase** had for its origin the water cup shown in Fig. 39. This was developed in various forms, until we arrive at the perfected work of the Greeks, where the surface was covered with ornamentation appropriate to its position, and moldings were carved with that extreme skill for which the Greek was ever noted.

60. The Chalice.—Another form of cup is the chalice, and it appears to have been developed from the primitive bowl suggested in Fig. 37. Bowls of that character were in early Greek times supported on a short stem, and the next step—that of elongating the stem and suppression of the side handles—became necessary when the cup was used for drinking purposes only. This form of drinking cup is not the one that was used for religious purposes, and extensive changes were subsequently made in order to suit it for its specific purposes.

The knop was added to the stem in order that it could be more easily grasped, and the base was greatly extended over

that of other drinking cups in order to minimize the danger of upsetting. The base was afterwards made irregular in shape, so that when the chalice was laid on the side to drain, as it frequently was, it would not tend to roll in

one direction or the other, and incidental with these changes, the profile of the cup became somewhat altered, until it assumed generally the form shown in Fig. 40.



FIG. 40.

obliquely downwards so as to make it more serviceable, at the opposite side.

61. The Jug and Ewer.—

The jug and ewer seem to have been evolved by an entirely different process from that which called into existence the vessels we have already considered, as these vessels have a long side handle for lifting them, instead of a stem. Ewers were probably derived from vases and beakers, by repressing the stem on one side and cutting the lip

62. Handles.—In designing vessels with handles it is important to give proper consideration for the position of the handle with relation to the lips and spouts of the vessel, in order that its contents may not act against the pouring action. The point whereat a vessel can best be grasped and turned to pour out its contents will be a little above the center of gravity of the whole mass, and it is of the highest importance to determine the point of the center of gravity in order that the handle will be properly placed upon a pitcher. This may be very easily done, graphically, by cutting out, in cardboard, the form of a vertical section through the center of the proposed vessel and drawing on this

section the vertical center line. If the card section is now hung, or supported, from any point on its upper edge, a vertical line passing through this point and across the center line will mark, where it crosses the center line, the center of gravity required. This experiment should always be tried in designing vases.

63. The tracing of the development of these forms thus far shows conclusively that every detail has had its origin in necessity—that the elaboration of these details has progressed in harmony with man's inventive genius and general ability through several ages. It is well to understand, though, that up to the present time there is no reason why any two forms should have been molded on exactly the same lines, or why infinite variety cannot be obtained by working the changes on these simple forms.

Too often the designer attempts to copy literally from nature in the production of some object, an idea for whose design he has drawn from a natural source. Take, for instance, the acorn, and assume that a vessel is to be designed with this simple detail as its model. To use the identical outline of the acorn, imitate its cap at the bottom, and raise it on a stem with a bunch of leaves for a base, in direct imitation of the original, is not designing a vessel on the type of the acorn, but making a metallic acorn suit the purpose of a drinking vessel.

We should do better to borrow ideas of outline and structure from the acorn and produce a hanap of the style shown in Fig. 41. Here there is no direct imitation of nature—no attempt made to deceive the eye into the belief that this cup is an acorn used for drinking purposes.



FIG. 41.

64. Suggestions From Nature.—There is no form in nature that cannot, if intelligently used, be made to give

suggestions for the design of vase and other forms. Take, for instance, the human form and extract its subtle lines, and one can readily, by repeating the soft curves on each side of an axial line, at least get suggestions that may be worked up into most pleasing forms.

In Fig. 42 is shown a vase or bowl, the governing outline of which is formed by two profiles of the human face arranged



FIG. 42.

at such an angle that they suit the conditions exactly. Such a design is suitable for execution in any wrought metal, but preferably in silver on account of the delicacy of some of its lines. The details of this design are associated with the sea, the base being formed of scallop shells, while the stem consists of groups of dolphins and other sea forms. The head of the mermaid at the top of the bowl is raised on the surface, and the locks of hair distributed in each direction as

though floating on the waves of the sea give an irregular outline to the top. The propriety of this distribution of hair is evident from two points; first, it produces the horizontal lines necessary to emphasize and apparently strengthen the weakest part of the vessel, and, second, applies a type of decoration consistent with the profile on which the outline is formed. The handles consist of dolphins reduced to conventionalized forms according to the principles suggested in the discussion of the animal elements of design in *Elements of Ornament*.

It is not necessary in a design of this character that the entire profile should be used, or that it should be maintained in this position or particular angle. It may be varied to suit any conditions according to the artist's fancy, and is used here only to illustrate that an interesting outline may be applied to various widely differing objects, always causing a pleasing effect inasmuch as it is the proportions and variations of the curves of these outlines that satisfy the artistic eye.

When such an outline is adopted, whether it is the profile of the human face, the curve of the neck, shoulder, or any other portion of the body, or an established outline of any other natural form, care should always be exercised that the surface decoration accompanying it is in harmony with the disposition of its various parts, and that members requiring a treatment in horizontal lines are not handled in accordance with the system of decoration that creates a wrong impression. Each thing should be suited to its place; no element should be applied unless it appears to be required, and no ornament should be placed so that it will destroy the effect of what is essentially an interesting outline or a well proportioned surface.

APPLIED DESIGN.

(PART 2.)

TEXTILE FABRICS.

GENERAL CONSIDERATIONS.

1. Appropriateness of Design.—In making a design for any class of textile fabric, the first object to be considered is, the use to which this fabric is to be applied. This having been determined, the ornament of the fabric can be considered either as part of the structure woven into the fabric itself, or stamped on its surface, as in cotton goods or in some silks. It thus appears that in the design of textile fabrics we do not necessarily work entirely on principles of art; but designate to the weaver, by means of drawings, details that are to confine him to a certain structure of goods.

2. Purposes of Fabrics.—The use to which a fabric is to be put very materially determines its structure, and we may divide these uses, purely from a utilitarian standpoint, into two classes—coverings for the body to keep it warm, and coverings for our walls and furniture, primarily, perhaps, as a decoration, but, in reality, also to provide warmth. In both cases, the goods will be called upon to fulfil one condition; that is, *wear*, and in this subject of wear we are concerned entirely with the structure of the goods, its ornament

affecting the wear only inasmuch as that ornament affects the structure. Some goods must bear strain in one direction to fulfil this condition of wear, others must be able to stand friction and general handling without apparent damage, and others are likely to be called upon for both these qualities.

3. Textile fabrics may be generally described as a combination of interwoven or interlaced threads, and the structure of that fabric consists of the method of interlacing these threads in order that the fabric may serve all the requirements of its purpose. Now, the threads that go to make up any woven fabric are divided into two sets—the *warp threads* that run lengthwise of the goods on the loom and are practically continuous throughout the entire piece, and the *weft threads* that run crosswise of the goods and interweave with the warp.

4. Weaving.—This interweaving is effected in the loom by lifting a certain number of warp threads and passing the weft thread under them, after which another set of warp threads is lifted and another line of weft thread is passed under.

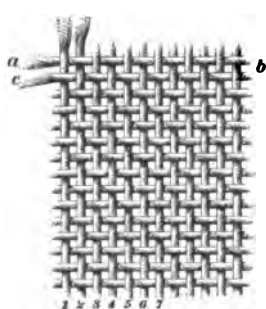


FIG. 1.

If, in this system of weaving, we lift every other warp thread and pass the weft through, and then lift every alternate warp thread between and pass the weft thread back, we will produce a weave of plain goods, such as is shown in the diagram, Fig. 1, where the warp threads with the odd numbers 1, 3, 5, etc. are lifted and the weft thread is passed through from *a* to *b*, then the even numbered warp threads 2, 4, 6, etc. are lifted and the weft thread is returned from *b* to *c*, and so on, alternately, weaving a piece of plain cloth the width of which remains constantly equal to *a b*, but the length can be unlimited and is determined entirely by the length of the warp threads that are wound on a cylinder in the loom, called the **beam**.

The structural design of any woven fabric depends entirely on the arrangement of these warp and weft threads, while its wearing qualities and utility may be dependent on the character of the threads themselves, both as to the material of which they are made and the manner in which they are spun.

5. Effect of Twist in Weaving.—It will be seen from Fig. 1 that the twist of the thread, or yarn, in the warp threads is at right angles to the twist of the threads in the weft and that it will be necessary, therefore, that these threads should bend around one another and, thereby, leave small open spaces, instead of lying quite tight and close together. The thicker the threads of which the fabric is made, the larger will be these open spaces; and the thinner the thread, the smaller and closer will be the weave. Other conditions of the yarn will affect these perforations also, as a thread that is soft and fuzzy will pack in rather closely and will practically fill up the open spaces by the projecting filaments of fuzz and make a piece of solid goods, so that in the mechanical process of weaving we can press the goods closely together and as the yarn springs out it will fill up these small openings and produce a solid piece of goods. On the other hand, if the yarn is twisted hard, so as to make a firm, solid thread, it cannot be compressed as can the softer yarn, and it will, therefore, be worked less closely together, producing an open fabric, but, owing to the hardness of the thread, a fabric that will bear more wear from friction than the previous one.

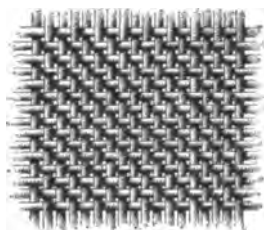


FIG. 2.

6. Now, in Fig. 2 we have an illustration of a fabric precisely the same as that in Fig. 1, except that the weft thread is twisted in its manufacture in the opposite direction to that of the thread used in the warp, and it will be observed that the lines of this twist are parallel in weft and warp and that when the threads are woven together the

individual filaments of one will fall between the individual filaments of another and, thereby, mechanically produce a quality of goods superior to that of which we have just been speaking.

It is therefore apparent that with the same quality of yarn we can make a stronger fabric by using the method illustrated in Fig. 2 than by using that shown in Fig. 1 and at precisely the same cost. This should always be borne in mind in working out a design for any piece of goods, whether it is to be ornamented or simply plain cloth, as one method will produce a close weave naturally, and another a close weave only by the use of soft or fuzzy yarn that can be made to expand, after being driven into position, and fill up the spaces.

7. Now, before we go into the conditions under which different classes of goods are woven, we will consider the material of which the threads of this warp and weft are composed, and we can then more readily understand the effect that will be, hereafter, referred to in different classes of goods.

CHARACTER OF THE THREADS.

8. A **thread** is a filament composed of small fibers that are either drawn out parallel to one another or twisted together in order to make them more or less compact. The fibers of which threads are usually made are obtained from wool, cotton, silk, and flax, and each one produces a fiber of a particular character that causes conditions to arise that can be obtained with no one of the others.

9. **Wool Fibers.**—A lock of wool examined under the microscope, just as it comes from the sheep, will show that its fibers are wavy and crimped, that the waves are exceedingly regular from end to end, and that the entire filament is covered with a series of small scales forming rings arranged around the filament and pointing from what was the root of the hair toward the top. If a piece of wool fiber

be drawn through the fingers from its root to its end, it will slip quite smoothly, but if drawn in the contrary direction, it will feel rough and present considerable resistance.

It is the scales on its surface and the crinkliness in its length that gives to wool fiber its particular value, and when this fiber is spun into thread it is arranged so that these scales on its surface are opposed to one another as much as possible and thereby interlock and hold fast to one another, and the more the thread is spun the closer do they engage one another and the stronger does the filament become.

10. Felting.—It is not only in the spinning that these scales are of value, but after the goods are woven they can be put through a process called **felting**, in which the fibers are pounded together and the scales made to interlock so firmly that the fabric becomes perfectly compact and homogeneous so that it is with the greatest difficulty that the individual warp and weft threads may be discerned and unraveled. The waves, or crimps, in the fiber are of value in this operation, as well as the scales. The felting is effected by wetting the cloth with soapy water and applying pressure. The result of this process is, that these fibers are straightened out and the scales of the opposing fibers engage, or lock in, with them, and when the pressure is removed the natural spring or crinkliness of the fiber causes it to return as nearly as possible to its original position and draws all of the other fibers with it, causing compactness in the goods. This operation is repeated several times so that the threads lose their individuality and the cloth becomes a solid compact mass. Where felting is carried out to its greatest extent, the threads must be especially prepared; and any pattern that is intended to appear in the weaving, through this process is seriously impaired or may be entirely lost. Different classes of wools vary materially in this quality of waviness, and, therefore, some are better suited than others to this class of work.

11. Cotton Fibers.—Under the microscope, a wad of cotton appears materially different from a lock of wool. Cotton is a vegetable fiber and, when magnified, appears as a thin flat tube or ribbon considerably twisted, and these twists in the fiber are what give the strength to the cotton thread by interlocking with one another somewhat after the manner of the scales on the woolen thread. The cotton fiber, however, is soft and pliable and does not possess that natural crinkly spring that we find in the wool; hence, threads that we are able to spin from it are weak and do not possess the ability to be felted as do the woolen threads.

12. Silk Fibers.—Silk is obtained from unwinding the filament from the cocoon of the silk worm and in reality is not materially different from ordinary spider's web. Under the microscope, it appears as a very straight, smooth, and highly polished fiber, somewhat like a glass rod. It is soft, exceedingly pliable, and lends itself readily to the formation of a thread, but it cannot be spun like wool and cotton, as it has no peculiarities of surface that correspond to the scales of the former or the twists in the latter, and silk filaments can be made into thread only by twisting, a number of filaments being twisted together into fine threads and then a number of these fine threads again twisted until a final thread of proper weight is obtained.

13. Flax Fibers.—Flax is a vegetable fiber appearing like long blades of grass. It is cylindrical in form, and has knots at regular intervals throughout its length. These knots act, mechanically, in the spinning of the thread in a similar manner to the scales in the wool and the twists in the cotton fiber.

14. Of each of these four classes of fibers we can make two entirely different kinds of thread, and it is in the manufacture of this thread that we materially affect the ornamentation and sometimes the structural formation of the fabric.

SPINNING THE FIBERS.

15. In order to obtain a clearer idea of the effect that spinning has on the fibers, the subject of wool spinning is here considered. The entire process of preparing the woolen yarns is given from the time the wool is taken from the sheep's back until it is wound upon the bobbin or spool from which it is woven into the fabric.

The wool comes to the mill in sacks and is emptied upon the floor and sorted, each lock being handled, examined, and placed in a separate pile, according to the quality and length of its fiber. It is then thoroughly washed, to free it from all impurities, and the fibers are then separated and straightened in a carding machine.

16. Carding Machine.—A carding machine is composed of large rollers from which short wires project similar to the bristles in a brush. These wires have slightly hooked ends, and as they turn they lock into the fiber of the wool and carry it around the drum or roller as it revolves. On their way around the roller, the fibers come in contact with a similar roller turning in the opposite direction, thereby engaging part of the fibers and pulling them away from the others. Thus the fibers are separated and re-separated on these revolving drums, called *cards*, the wires on which become finer and closer together as the wool fiber proceeds, until at the end of the final drum it is scarcely rougher than a piece of fine sandpaper.

There is no attempt here to keep the fibers parallel. They are simply separated and bunched together across the end of a cylinder forming a long soft rope-like sliver that possesses only tensile strength enough to support its own weight as it is drawn into a round box, or can, from which it is taken to the throstle frame, or to the spinning mule.

YARNS.

17. There are two kinds of woolen thread—one, commonly known as *woolen*, and the other as *worsted* thread. When wool is intended for the production of woolen thread,

it is passed through two or three of these carding machines in order to reduce it to a finer quality.

18. Woolen Yarn.—The essential distinction between woolen and worsted yarns consists of a difference in the quality of the wool and of a difference in the methods of spinning into thread. Generally, it may be said that woolen yarns are made from shorter fibers than worsted yarns and of fibers that possess the highest felting qualities, or in other words, that are most sharply crinkled, and that the yarns are prepared from the carded fibers more or less crossed and interlocked with one another with no attempt at parallelism. Though these may be spun hard upon the mule frame, they form a light fluffy yarn that is suitable, when woven into cloth, to produce a partially felted goods, which, in reality, is the distinguishing characteristic between woolen and worsted goods.

19. Worsted Yarn.—Worsted yarns are generally made of the long silky varieties of wool, and the fibers are combed as well as carded, in order to bring them as nearly parallel to one another as possible. The spinning of worsted yarn is accomplished on a throstle frame and the thread is smooth and compact and does not partake of the character of felting in any part of its weaving.

In all varieties of worsted and woolen yarns there is a tendency for each to partake largely of the characteristics of the other, some woolens being made from longer wool than are some worsteds, and worsteds being made from short staple wool, so that the actual length of the fiber has nothing to do with the classification, but its felting quality and method of conversion into thread forms the distinction.

20. Preparing Wool for Spinning.—When the carded wool has passed through the third carding machine, it is in the form of a continuous evenly distributed mat around the last cylinder. To prepare it for spinning, it must be divided into a series of equal strips or ribbons, and these condensed into a round ~~silver~~ sufficiently compact to stand winding on

a bobbin. The condenser for doing this is attached to the carding machine, and as the strips pass off the drum they are acted on by a pair of rubbers that simply pinch the sliver down to a smaller size, by compacting the fibers without twisting them. From this they pass to the spinning mule and are drawn down to fine threads.

21. The Mule.—The mule frame on which this spinning is effected acts in a similar manner, but on a larger scale, to the old-fashioned spinning wheel. Large bobbins or spools of the wool sliver are placed on the frame and their ends drawn and attached to vertical spindles that revolve and give a twist to the yarn as it draws it. The frame containing the spindles advances to the sliver spools and then backs away from them, as the sliver is gradually fed out as the spools revolve. The entire distance moved by the frame is 6 or 7 feet, during two-thirds of which the sliver is fed out as the frame recedes, but during the rest of the distance the spools remain stationary and the sliver is drawn or stretched, thereby becoming thinner, and at the same time it is rapidly twisted by the revolving spindles into an even compact thread. When this twist is completed, the mule frame advances toward the sliver spools again, and the spun threads just completed are wound upon the spindles as the mule frame advances.

22. The effect of this drawing and twisting at one time is one of the characteristics of woollen thread. It is evident that, in drawing, the stretch will not take place evenly and that some portions of the yarn will be thinner than the others; but it is also evident that these thinner portions will be the ones that will be first affected by the twisting, or spinning, of the bobbins and when once twisted become hard and less subject to drawing, thereby causing the thicker portions between them to be drawn out more. While the tendency of this work is to equalize the thread, somewhat, it is not sufficient to compensate entirely, and, therefore, woollen thread is unequal and irregular in its thickness.

23. Knitting and Carpet Yarns.—While the technical definition of worsted yarn requires that it be made of fibers that are parallel with one another and it is restricted to two methods of manufacture—of long wool, by the method of drawing and combing, and of medium and short staple wools that are first carded and afterwards combed—we have a third class of worsted yarns, but in reality they are worsted only in the sense that they are not meant for felting. These are yarns for carpets and knitting yarns, each being full and open in structure and prepared for spinning simply by carding in the manner that woolen yarns are made. As said before, we class them as worsted yarns simply because they are not fit for felting.

24. Combing.—Before the slivers pass through the operation of combing, they are put through a **gilling machine**, for the purpose of making them uniform in size and quality and at the same time making all fibers parallel to one another. Several slivers are fed into the gilling machine, and drawn into one; this process is repeated several times, if necessary, in order to get a final sliver of uniform quality throughout. It is then passed through a combing machine, which removes the short fibers and leaves the sliver even, compact, and uniform in quality and composed almost entirely of long fibers.

As it is delivered from the combing machine the sliver is made up into a ball on a bobbin that winds it up with an oscillating motion, in order to wind the sliver up in a diagonal direction alternately from end to end. The sliver is then drawn out by passing it through sets of rollers, the first pair of which revolves much more slowly than the next pair, so that between the two pairs of rollers the sliver is constantly being drawn or stretched out. Now, assuming that the sliver is to pass through six such drawing frames, six slivers may be fed into the first and drawn out to the dimensions of one, and the same may be repeated in the next five slivers that are put in. In this manner, a sliver may be drawn out several thousand times its original length,

according to the quality and uniformity that is demanded in the goods.

25. Throstle Spinning.—After the yarn is drawn and redrawn, the bobbins containing it are placed on a throstle frame for spinning. In this process, the drawing is effected in exactly the same manner as in the woolen yarn on the spinning mule. The **rovings**, as the drawn yarns are called, pass between pairs of rollers in which they are drawn out by the difference of speed of rotation between the front pair and the back pair, and as the cylinder cord is delivered from the front pair of rollers, a spindle that is revolving rapidly gives it the required twist.

These yarns or threads are known as **singles**. For some uses they are twisted into two-ply or three-ply yarns on a twisting frame where each single is drawn from a bobbin and twisted with others into a two-ply or three-ply yarn, as the case may be.

26. Characteristics of Worsted Thread.—In worsted thread we have a yarn of great uniformity and evenness of diameter, all the fibers being parallel and as nearly as possible of the same length. It therefore possesses the advantage of uniformity in strength and is especially suited to the weaving of fabrics where a pattern is to show in the finished product as a result of the system of weaving. It will not be suitable for milling or felting, because the fibers, being parallel, will not lose their individuality. It will not resist wear from friction to the same degree that woolen will, because the threads will retain their individuality and not become felted into the general mass; and thus the fabric not being so compact as woolen, it will not possess, to the same degree, the quality of retaining warmth.

On the other hand, the subsequent processes through which the cloth may pass to finish it will in no way impair the pattern, and a worsted fabric is always recognized by the clearness of its pattern and the sharpness and smoothness of its finish, both wool and worsted being possessed of individual properties and advantages.

COTTON, FLAX, AND SILK.

27. Cotton Yarn.—Cotton is prepared by carding in much the same manner as wool, but subsequent processes are necessary to equalize the fiber, as was the case in the manufacture of worsted. Cotton is sometimes combed when a very high class of yarn is desired. It is spun into threads in much the same manner that worsted is spun, and the majority of cotton yarns partake of the mechanical characteristics of both woolen and worsted.

28. Flax Yarn.—The two yarns prepared from flax are *linen* and *tow*. Linen yarn is prepared similar to worsted, but the machinery is essentially different on account of the difference in the character of the fiber. Raw flax is beaten, or crushed, in order to make it pliable; this is called **hackling**. After that, it passes through a combing operation that, in linen manufacture, is called **scutching**. Where the fibers are too long to work readily, as is frequently the case, they are broken in a machine called a **saw**. After scutching, the fibers are carded and the short ones are converted into tow yarn, while the long ones are spun into linen yarns.

29. Silk Yarn.—Silk yarn is different from any of the previous fibers, the raw silk being obtained by drawing it from the cocoon of the silk worm in one long, continuous filament. Several of these filaments must be combined in order to produce a **tram**, or an **organzine**, the former being used for weft in weaving and is put together loosely with little or no twist, and the other, used for warp silk, is twisted firmly to make a compact thread. Both qualities are composed of long filaments and are well suited for the production of more or less elaborate patterns in the fabric.

There are many cases, however, where the cocoons are damaged, and the filament cannot be wound from them in a continuous thread. These cocoons are usually torn up and the fibers are combed and laid parallel to one another in the same manner as in cotton or worsted. The silk yarn thus made

does not possess the freedom from fuzzy surface that raw silk does, yet many of the combed fibers are of considerable length and this makes a very strong thread well suited for the weaving of ornamental patterns.

30. The object of this short discussion, the manufacture of threads, is to enable the student to be familiar with the materials that are to be woven into a fabric, the design of which he is to execute. In the descriptions that follow of the weave of certain classes of cloths, the student can readily see wherein a knowledge of yarn or thread will be of great value in the preparation of his design.

WARP AND WEFT.

31. Plain Fabrics.—In the fabrics shown in Fig. 1 we have what is called a *plain* fabric, that is, one in which the **warp** and **weft** threads are equal in quantity and diameter, but we may alter this relation of warp and weft and by so doing obtain an increase in weight of the goods; thereby making a warmer cloth, if for wearing material, or an increase of strength, where that is a requisite quality, or, in other cases, an increase in ornamental value, if it is desired to increase the effect of ornamentation by the weave.

32. Where the warp threads are heavier than the weft threads, the weft will naturally bend around them and cause ribs to appear lengthwise of the fabric; but where the weft threads are the heavier, the warp will bend around them and cause ribs to appear running across the fabric. The best quality of fabrics, however, are those in which the warp threads are the thinner and are arranged with a greater number to the inch than the weft threads.

The weaving of these classes of goods is precisely the same as the weaving of plain cloths, but the variations of the relative quantities or thicknesses of warp or weft completely changes the character of the fabric. In goods where the weft threads are thicker than the warp threads and the warp

threads are packed closely together, the weaving binds the warp threads so closely that it actually compresses them between the weft threads and makes them occupy less space than their true diameter. The warp threads being placed close together and crossing one another around each weft thread, or **pick** as it is technically called, it makes no difference how much tension be put upon the warp, either in the process of weaving or after the process is formed, it will not bend the weft out of line, simply because the spaces between the warp threads are so small in comparison with the weight of the weft thread that the latter cannot be bent in any direction. Thus, a very firm goods is formed. Therefore, in this class of goods, the closeness of the warp and the strength of the weft give it the property of resisting wear and retaining warmth.

33. Another system of weaving is to have the warp threads and the weft threads alternately heavy and light, thereby causing the thin threads of the warp to wind themselves around the heavy threads of the weft, and the thin threads of the weft around the heavy threads of the warp. A characteristic style of goods of this class is what is commonly known as **repp**, but in this particular fabric the weft lies in perfectly straight lines and the warp winds around both the thin and the heavy threads.

34. Twills.—In twilled fabrics there is an effect of ribs running diagonally across the goods, not by varying the weights of threads, but by varying the proportions of warp and weft that come to the surface. In making twills, there are two general objects sought—one, to increase the bulk of the goods, and the other, to ornament its surface.

The essential difference between a plain weave and a twill is, that in the former the warp and weft interweave alternately, while in the latter the warp and weft interweave at varying intervals so as to produce the desired fabric. For instance, in Fig. 3 it will be observed that the weft thread *a b* passes over the warp threads 1 and 2 and under the warp

threads 3 and 4 and over the warp threads 5 and 6, and so on, and that the weft thread *c d* passes over the warp thread 1, under the warp threads 2 and 3, and over the warp threads 4 and 5. This produces an effect that, in some goods other than cloth, is called a *basket weave*, but, as a matter of fact, it is a simple twill upon the variation of which much designing in dress goods is accomplished. Each warp thread passes alternately over and under two weft threads, or picks, and similarly each weft thread alternately passes under and over two warp threads, but each end does not pass over the same threads as its predecessor.

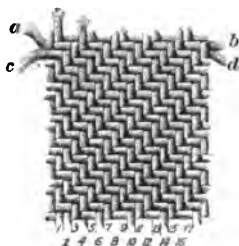


FIG. 3.

35. This not only produces a pleasing pattern on the surface, but it enables us to introduce more material into the goods we are weaving, and, therefore, to produce a more bulky fabric that is closer in its structure. The reason of this is, that the warp and weft interweaving at greater intervals permit the skipped threads to lie closer together without any intervening transverse threads, thereby making a closer and warmer fabric.

In the plain cloth, we have shown that we are able to make goods wherein the warp threads lie very closely together and, also, goods wherein the weft threads lie very closely together. In each case, the threads of the opposite system are quite a distance apart, but in the twill we are enabled to weave cloth wherein the warp and weft both lie very closely together and give an even texture in both directions and, consequently, a corresponding increase in the bulk of the fabric.

36. The twill may be altered in detail so as to increase the bulk of the goods, simply by increasing the interval at which two sets of threads interweave. For instance, the warp thread may pass over several weft threads before it

interweaves again and in this way bind this number together in close contact and crowd them into a much smaller space than they would have occupied had they been interwoven alternately. But as this increase in weight is produced by the skipping of a greater number of threads, the fabric loses strength, inasmuch as it may not be properly interwoven, and a considerable amount of friction of its surface will allow these long overshot threads to become broken and to weaken the fabric by *fraying*.

37. The yarn of which the goods is woven is composed of single fibers, and when overshot for considerable distance these fibers are presented to a greater length than they may possibly be able to bear, causing a weak but warm fabric. The looseness of the fabric will also reduce its power to bear strain, and although a loosely woven cloth may be proportioned to its interweaving so that it will be stronger under tension than one more closely woven, yet it will never be so strong in proportion to the relative kind of material of which it is composed.

38. It is possible to make another order or arrangement in twills, wherein we abandon the idea of increasing bulk or warmth and endeavor to weave in order to acquire the greatest strength; when it is desired that the pattern shall be ornamental as well as be strong or warm, it must always be borne in mind that the character of the weave affects all three conditions—strength, warmth, and ornamentation. The class of goods known as *satins* are twills woven on a regular systematic basis; that is, the order of interweaving two sets of threads does not follow consecutively but at intervals.

In Fig. 4 is shown the system on which a satin is woven. It will here be observed that the threads interweave at every fifth end or pick and that the two succeeding picks do not interweave with adjoining ends but at intervals of two; that is, if weft *a* passes over No. 3 warp, weft *b* will pass over No. 6 warp, and so on. Now, if it is desired to

produce a fabric whose greatest strength is to be in the direction of its warp, it would be made on what is termed a warp surface. The warp threads will be laid in the loom as closely as possible, and as the weft threads are inserted, one of the warp threads will be withdrawn and bent around the weft at the back. As the next pick is inserted, another end will be withdrawn, the first one returning to its original place, but as the ends are not withdrawn in consecutive order, the weft does not bend around the warp to any extent and is practically straight, while the warp itself is drawn out of its course. In this way the weft threads are not kept very close together but are separated from one another by the thickness of the warp threads. Therefore, there are a greater number of warp threads to the inch than weft threads.

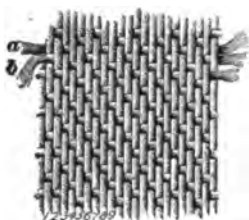


FIG. 4.

39. Now, if it is desired to produce a perfectly smooth, unbroken surface on the fabric, the warp threads may be placed so closely together that as one is withdrawn to bend around the weft, those on each side of it will close over the vacancy and completely hide the point where it is interwoven with the weft. In that case, the number of warp threads will be increased in proportion to the number of weft, and, consequently, the fabric will be capable of bearing an increased strain in the direction of the warp and a decreased strain in the direction of the weft. Moreover, it should be borne in mind that on account of the warp thread predominating, the fabric when handled possesses a glossy or smooth surface in the direction of the warp and a roughened surface across the warp.

40. This same principle may be carried out with the weft threads predominating and the warp threads set so far apart that they will permit the weft threads to interweave between them. The weft threads are inserted as

closely as their sizes will allow, and pass over and bend around the various strands of warp. Of course, in such cases, the greatest strength of the fabric is across the goods in the direction of the weft.

DOUBLE CLOTHS.

41. Double cloths do not differ materially in principle from ordinary woven goods, but they belong to a different class of fabric. A double cloth is suitable for a purpose wherein great weight or bulk is required, without, at the same time, producing a coarse, open structure that would result from using coarse threads. In ordinary weaving there are but two ways of producing a heavy fabric—either to use very coarse threads, or to use an increased number of fine ones. Coarse threads will produce a coarse-looking cloth, no matter how they may be woven, and there is no way of reducing this, but with fine threads the order of interweaving will prevent the introduction of a sufficient number of threads in plain work, and there is no alternative but to manufacture a double cloth.

By this method we do not try to crowd a large number of threads, but we weave what is practically two fabrics—one above the other, with a sufficient number of intervals and interweavings to join them in one. There are several classes of goods termed double cloths that do not necessarily fulfil all the conditions of a double cloth, but simply are double-faced cloths. With these there is usually one warp and two wefts, or sometimes one weft and two warps, but in a true double cloth there should be two separate fabrics each having its own warp and weft.

42. The two fabrics are woven at one time and are intermixed with each other, but in reality they do not lose their individuality at all, whether they are combined for the purpose of producing a double-faced cloth or for the purpose of increasing the weight. Where there is a single weft and a double warp, the weft simply weaves with one warp

to produce a figure and at intervals of several picks interweaves with the other warp, thus tying the two warps together and producing a double-faced goods where the warp forms the prevailing material.

This is shown in Fig. 5, where at *a* are seen the ends of the upper warp, at *c* the ends of the lower warp, and at *b*



FIG. 5.

one thread of the weft weaving through the cloth and catching a pick of each warp. In this manner, we have the warps separated from one another and a means of producing a very heavy fabric with great strength in the direction of its length. The cloth itself is reversible, and one side may be any color or check and the other perfectly plain, as a lining.

43. In exactly the same manner that we made our satin, as shown in Fig. 4, we can weave our double-faced cloth to have the warp or weft predominate. If the weft is to predominate, the conditions are reversed somewhat and the greatest strength of the goods will be across instead of lengthwise, as shown in Fig. 6, where at *a* is shown the



FIG. 6.

upper weft and at *b* the lower weft, while at *c* are the ends of the single warp, the two wefts interweaving with this warp alternately producing a very heavy cloth with two wefts and one warp. The ornamenting of the surfaces can be carried on quite independently of each other, the only considerations required being that the weaving of the

ornament must be such as will permit the interweaving of the opposite side at certain fixed intervals.

44. Ornament Threads.—Still another way of ornamenting cloth is by the introduction of additional threads, threads that exist in the cloth for no other reason than to produce ornament. If we conceive a plain cloth to be woven double with a series of unused threads lying between the two surfaces and these unused threads drawn to the outside of the cloth whenever we want to produce an ornament or design on the surface of the goods, we have a condition wherein one quality of material is put into the goods to stand wear and another quality is put in to give the ornamentation. Each one is entirely independent of the other in quality and purpose, but both are interwoven to form the desired article. In this class of goods we have plush and velvet, and they come under the head of what is known as **pile fabrics**. The term “pile” is applied to all goods wherein the surface is ornamented by drawing up the threads to form an extra surface, as in plush, velvet, Brussels carpet, etc. This gives us an extensive field for ornamentation, inasmuch as the threads can be brought so closely together that they obliterate the warp and weft backing entirely and produce an unlimited variety of design on the surface.

45. Laying Out a Design.—In weaving all kinds of cloths and carpets, the design for the weave is laid out on a special kind of paper ruled off in squares, as shown in Fig. 7, with a varying number of subdivisions to the inch according to the goods and the number of warp and weft threads used. In this design paper each series of vertical spaces usually represent warp threads, and each series of horizontal spaces or squares represent weft threads. The design is

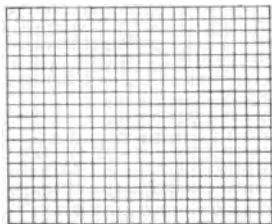


FIG. 7.

expressed on the paper by filling in the squares where the weft thread comes to the surface or falls below the surface, as shown in Fig. 8, which is a design for a twill composed of six ends, the weft thread coming to the surface over the warp thread and then falling below the surface and passing under two warp threads progressively throughout the piece. Each of these black squares represents a pick in the loom.

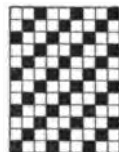


FIG. 8.

46. If the number of threads per inch of weft and warp are the same, the angle of this twill will be 45° , because it will move in each direction, progressively, at the same rate, and the warp or weft in this particular pattern must predominate on the surface, as on one side the weft passes under twice as much warp as it passes over, and on the other side the warp passes under twice as much weft as it passes over. This is the first principle of ornamentation in fabrics where color is not used and represents the principle on which ornamentation is attained in the greater number of dress goods that are of one color only.

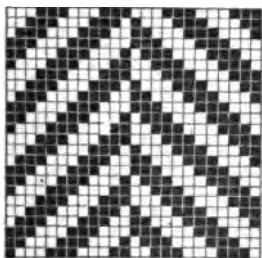


FIG. 9.

the same amount of warp and weft are on the surface. Then, for the twelve additional picks the twills reverse in direction, thus producing a checker effect in squares each representing twelve picks. There is no limit to the amount of surface decoration that can be obtained in this way, and the student should bear in mind all these

47. This ornamentation may be carried out in a checker pattern somewhat after the manner shown in Fig. 9, where the twills run diagonally for twelve picks, and

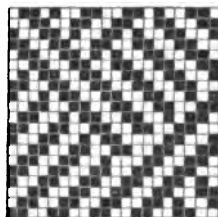


FIG. 10

possibilities in the weaving of cloth fabrics before he considers the subject of color.

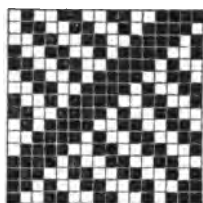


FIG. 11.

A pattern of this character, where the warp and weft are of different colors, will produce goods running in diagonal stripes as well as diagonal ribs. Figs. 10, 11, and 12 each show arrangements whereby the pattern may be varied on the system of the simple twill, which is an economical method

of producing a variation of surface. This is the principle on which most woolen goods, such as are used for men's clothing, are made.

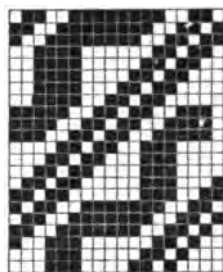


FIG. 12.

48. Laying Out Ornamentation.

—Figured fabrics present a problem that is different from that of any of the twill systems that have so far been discussed, inasmuch as the pattern forms a fixed and definite design all over the fabric, and our designs for these have been designs for the whole fabric. If we now consider the ornamentation of a fabric where specific ornament is worked out in spots, we must consider the appearance of these spots on the design paper and the characteristic limitations of their mechanical reproduction in the loom. For forming this figure on the surface of the cloth we may either use the material of which the cloth itself is woven, or, as already suggested, we may introduce extra material, which exists for the sole purpose of forming the figure.

In a plain cloth, additional warp or weft may be introduced in order to weave the figure without in any way interfering with the weave of the plain fabric, or the warp or weft of the plain fabric may be caused to cease interweaving regularly and to come to the surface in considerable quantities in order to produce the figure. Usually, the figures woven in a fabric are composed partially of the ground material of

the fabric itself and partially of other material introduced purely for ornamentation.

49. In Fig. 13 we have an example of a pattern for a perfectly plain cloth on which a lozenge-shaped spot is woven, and in Fig. 14 we have a section through that cloth where, at *a*, the ends of the warp threads are shown and, at *b*, the weft thread, interweaving regularly except where it passes over the five warp threads to form the pattern in the center of the lozenge-shaped spot, as at *c d*. The general body of the cloth remains perfectly plain, and the pattern is formed simply by the skipping of a few threads. Of course, this affects the quality of the goods somewhat and it is not so closely woven, but this

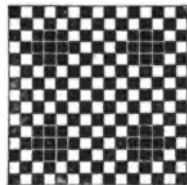


FIG. 13.



FIG. 14.

defect will vary according to the size and number of figures that are introduced.

50. In Fig. 15 we have an example of a piece of goods woven on the principle shown in Fig. 14, and the number of spots is distributed evenly over the entire piece. Each spot must be examined in its relation to each pick and warp end, in order to comprehend the pattern. The spots *a* each commence on the same pick, and so do the spots *b*, *c*, etc., and, further, we can see that *a* and *c* are also woven on the same warp ends, as are also *b* and *d*, so that in reality *a* is a repetition of *c* in the direction of the warp, and *b* is a repetition of *d* in the direction of the weft. Consequently, we can see that *a* and *b* are the only two spots in the pattern, the others be-

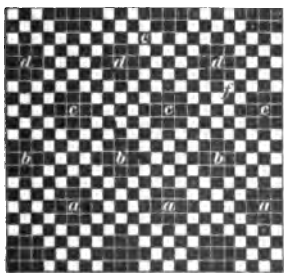


FIG. 15.

ing arranged to duplicate these in different positions and produce an all-over effect.

Technically, this style of pattern is called "two spots set alternately," and it simply means that there are only two spots in the complete pattern and that they are so arranged that they alternate in the order of weaving. This is the simplest way of arranging spot figures, no matter what may be their size or form, but it creates a great disadvantage in the structure of the cloth.

51. If we look at Fig. 15, we will see that the weft passes over five warp threads through the center of the spots and then interweaves with but three of them, and the same occurs with the warp thread through the centers of the figures, as is also shown in Fig. 14. Now, if we look along the line of interweaving marked *e*, we will see that the warp and weft interweave alternately throughout the pattern, and the same occurs with the warp thread along the line *f*. Now, such a variation in the order and system of weaving the various threads produces irregularities in texture that are a detriment to the quality of the goods, inasmuch as there is a wide variation in the tension of the different warp and weft threads causing a cockling of the surface. In a small pattern like this one, the damage would not be serious, but in large and bulky goods, such as carpet, the defect would be very objectionable and might render an otherwise good design utterly useless.

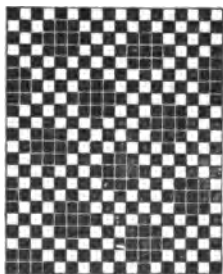


FIG. 16.

52. It is therefore evident that if this system is to be used on a larger scale, we must provide a different method of arrangement. Whatever system we use, we certainly must preserve a regularity of the spots and keep them equally distributed, and in Fig. 16 will be found the most suitable arrangement for work of this kind. The same spots exist here and are the

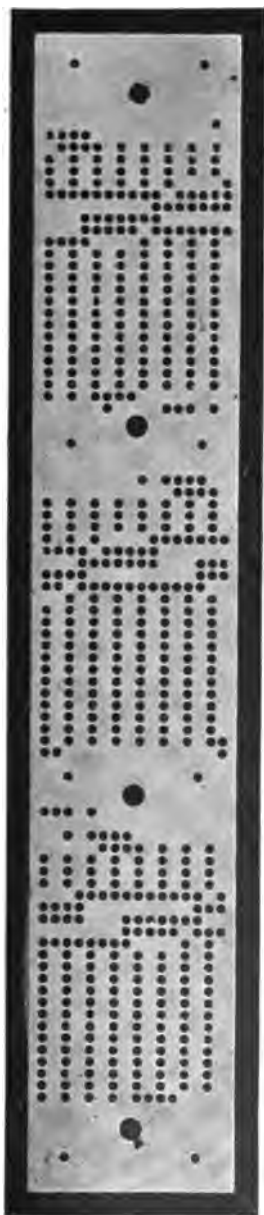


FIG. 17.

same distance apart, and the order of interweaving each respective pick and end is equal. The appearance of the finished cloth will be the same as that of Fig. 15, but it will be more perfectly constructed and certainly more pleasing to the eye.

This system of weaving is very simple and is based on what is called an **eight-end satin**. In laying it out, we must calculate the area of the figure to determine the number of the ends and picks that will be required to produce it, and if this number does not conveniently fit in with the number of hooks contained on our *Jacquard machine*, then we must alter it to suit as the case may require.

53. The Jacquard machine consists of an apparatus that is supported above the loom, and by means of a number of wire hooks extending to each thread of the warp in the loom, it raises certain desired warp threads and permits the shuttle with the weft wound on it to pass under the raised threads and over those that lie below. In weaving any kind of goods each throw of the shuttle is preceded by a raising of certain warp threads under which it is desired that the weft shall pass. These raised threads are usually called the "shed."

54. The design is punched on cards similar to Fig. 17, where each hole represents one of the squares of

our design paper, and these cards passing through the Jacquard machine press against a series of pins that cause the hooks to be released and prevent the warp threads attached to the hooks being raised. Where the holes exist in the cards, the pins pass through and the hooks are not released, so that the threads represented by these holes are lifted and appear on the surface of the goods in the weave after the shuttle has passed through the loom below. The Jacquard cards are all the same size and linked together to form a chain. For some classes of goods, such as carpets, it is sometimes necessary to have several thousand of them in order to weave one pattern. Each card represents one pick of the loom, and the practical weaver can look at a Jacquard card and see the pattern that it will work out quite as clearly as the practical designer can see the pattern on his design paper.

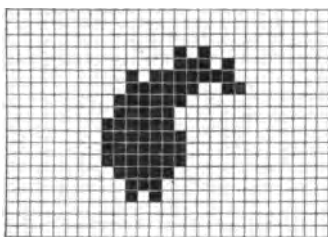


FIG. 18.

be borne in mind that if a figure covers considerable surface an effort must be made to tie it in, in some points. In Fig. 18 is shown a figure where a considerable portion of the thread extends over several picks, and it is very evident that if so woven the design would not wear well, as it would leave so much less material on the surface. The long threads that constitute this figure, however, can be tied in at half intervals either by means of a series of extra picks through the center, as shown in Fig. 19, or by a systematic tying around the edges, as shown in Fig. 20. Where these ties can be made a part of the design it is

55. In laying out a pattern on design paper, it should

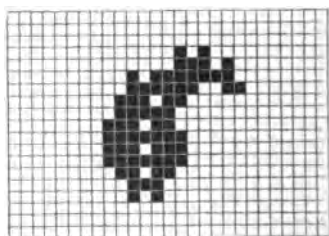


FIG. 19.

so much the better, but in any event they should be introduced in order that the goods will not be too loose and irregular in its weave.

56. This brings us down to the figuring of the surface of fabrics in their pile, and this is of considerable importance to us, as in this class of fabric are included both

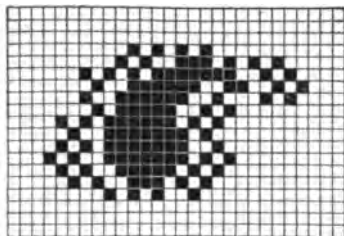


FIG. 20.

Brussels and Wilton carpets, as well as velvets, plushes, and other goods with a soft surface finish upon a ground warp of coarser material. This class of goods differs from all other classes, in that its surface consists of a series of short threads that issue from the body of the fabric and present their ends to the eye, or else issue from the fabric and return presenting the end of a loop or the end of a series of loops to the eye. Pile fabrics are of two classes—*cut* and *uncut*. The pile in the former, after issuing from the body of the fabric, is cut so as to present the ends, as in plush, velvet, and so on; in the uncut pile the loop remains as it is formed in the weaving and presents a class of goods of the character of Brussels carpet, and so on.

57. The pile surface of goods may be formed either in the warp or the weft, and this formation of the pile also divides pile fabrics into two separate classes. **Weft** pile consists of a series of weft threads floating loosely over its surface, usually as a figure, and bound at regular intervals into the ground cloth below. This loose material is cut, leaving the ends projecting on the surface of the cloth in varying lengths according to the character of goods required.

In Fig. 21 is shown a section of a cut pile fabric. Here the dots represent the warp, and the weft *a* interweaves alternately with the warp forming a body cloth of plain regular weave. The *pile* weft *b*, however, interweaves into

the ground at longer intervals, and is then cut as shown at *c*, leaving the loose ends to stand above the ground warp and form the surface. The pile must be well bound into



FIG. 21.

the cloth, or it will pull out of its surface and, in time, leave nothing but the ground cloth.

58. In the formation of pile surfaces with **warp** pile, we have a more convenient and useful fabric and a class with which we are somewhat more familiar. In **weft** pile there is one warp and two wefts in the fabric—one weft to form the body of the goods, and the other to form the pile; in **warp** pile there are two warps and one weft, the second warp being solely to form the pile on the surface. Where the pile is made up of the weft, the cutting of the pile takes place after the goods are completed, but with warp pile the cutting takes place with the weaving, if it is to be cut at all. So that we have two forms of warp pile, commonly known as *cut* and *loop pile*, or sometimes as *cut velvet* and *terry velvet*, but whether the pile is cut or uncut the structure of the cloth is absolutely the same.

59. Velvet is formed by pile warp issuing from the cloth, passing over a wire, and then passing into the cloth again where it is interwoven to secure it firmly. We can bring the whole of the pile warp over this wire at once or we can bring only a portion of it, but in either case it must be firmly bound into the body of the goods when it returns.

60. The ornamentation of pile fabrics must be considered under two heads, the decoration of pile fabrics themselves, and the decoration of fabrics with pile. The first system suggests the ornamentation of fabrics by the use of colored pile. In ordinary velvet, color can only be used under limited conditions and cannot be used in a general

way. The pile on the surface of the fabric covers the ground cloth entirely and any ornamentation that is introduced must be introduced into the pile warp. Therefore, if we introduce a variety of colors they will naturally run in stripes, and regular figures cannot be formed. The warp, existing as it does of a number of parallel threads, should we make them of different colors with a given number of one color and another number of another color, when these are woven into the fabric and form the pile on the surface, they will introduce the same stripes exactly on the body goods as in the pile and thus limit our ornamentation on very narrow lines.

61. The ornamentation of pile fabrics may be accomplished by forming patterns with the pile itself without the aid of color. We may form a pattern by varying the length of the pile, but this will usually form a stripe across the piece, because the different lengths of pile are produced by the introduction of wires of different sizes. Another system of ornamenting the surface is by a system of cut and uncut pile, the figures being formed in terry velvet. The same warp can be used for the formation of both kinds, but two kinds of wires must be used—one, a plain wire to form the loop, and the other, a wire terminating in a knife at one end that will cut the loops as it is drawn out.

62. Brussels Carpet.—Brussels carpet is a form of terry velvet, the ornamentation of whose surface is accomplished by the introduction of extra material, and it is necessary, in explaining the designing of these goods, that considerable attention be paid the weave. The pile on Brussels carpet is formed, in precisely the same manner as terry velvet, by the insertion of wires under the pile threads, but the selection of the threads to form the pile is entirely different. In weaving the velvet, we bring all or a given portion of the pile over the wires at one time, but in Brussels carpet we have a series of duplicate ends in the warp, each of a different color, and from these our Jacquard

selects one, according to the pattern we require, brings it to the surface and passes it over the wire. In ordinary velvet, the pile warp returns to the ground and interweaves in the same manner as the ground warp, except at the points where the pile is formed; but in Brussels carpet, the pile warp does not weave in any place into the ground, but lies as a straight thread in the body of the carpet, where it is not used in forming the pile.

63. Now this can be somewhat more clearly shown by referring to Fig. 22, where the ground warp is represented by the lines *a*, and the weft by the dots, while at *b*, *c*, and *d* are three colors of pile warp that are to form the pattern on the surface of the carpet. It will be observed that the ground warp *a* weaves regularly and alternately throughout the entire fabric from side to side, but that the colored warps *b*, *c*, and *d* lie perfectly straight in the body of the goods until they come to the surface in forming the pile

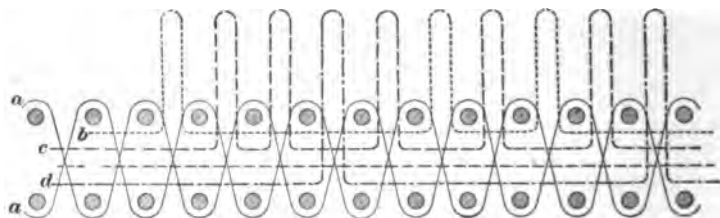


FIG. 22.

loops, as shown. The pile warp lies between the ground weft and is intersected by the ground warp, so that where no pile loops are formed there is a plain cloth with a stout back in the middle, the threads of which are perfectly straight and take no part whatever in the formation of the cloth, except to give bulk to it. Between every pair of ground warp threads, there is one thread of each color of the pile warp that is to be used. When the pattern is formed, one of each of these threads is raised between each pair of ground picks, passed over the wire, and returned to

the cloth. If it is again required, it again comes up, but the threads are dormant and useless except where they appear in the figure. Thus, it will be seen that though there may be four, five, or even six colors, and consequently as many separate threads between each pair of ground threads, only one of each is brought to the surface, according to the color that is required.

This makes an expensive weave, but it produces a uniform surface and body of cloth, and the pattern is formed by color, so that any amount or variety of it will in no way affect the structure or quality of the goods. The colored material forming the pattern is in the carpet at all times, and is only brought to the surface where it is required.

64. It will be apparent that these idle threads lying straight in the carpet and forming loops at irregular intervals, must be used in varying proportions, so that they cannot all be wound on one cylinder or beam at the end of the loom as is the ground warp. For instance, the ground warp interweaves with the weft at every pick, whereas the pile warp may remain as a straight thread through several picks. Under these circumstances, a strip of ground warp twice as long as that of the pile warp may be consumed in a given number of picks, and it is evident that the two classes of warp could not be wound upon the same beam.

65. So, in the manufacture of Brussels carpets, the pile warp threads are wound on separate spools or bobbins, each bobbin serving for a single color and the bobbins being arranged in series on a frame. Each color has a frame to itself, and this arrangement of the threads on frames gives rise to the descriptive terms used in Brussels carpet trades, such as five-frame Brussels. This term means that the carpet contains five sets of pile-warp threads, each set having been wound on bobbins and supported by a separate frame. These frames make carpet looms very bulky machines, but without them it would be impossible to produce the goods.

66. In designing carpets, each square on the design paper represents one loop of the pile. If the carpet is a velvet carpet, where the pile is cut, then the square on the design paper represents the two ends of the cut loop, and in laying out the design this should be borne well in mind. It should also be borne in mind, that the more colors that are used, the more material there is in its body and consequently the more expensive it becomes. The main divisions of design paper used for Brussels carpet are in squares of $\frac{1}{8}$ inch, but in moquette carpet they are as large as $\frac{1}{4}$ inch. Low ingrains have the squares $\frac{1}{16}$ inch, but regular ingrains are $\frac{1}{4} \times \frac{1}{8}$ inch. That is to say, the threads of warp and weft are proportioned to run 7 to the inch in one direction, and 8 to the inch in another.

67. In laying out circular or other curved figures on design paper, it should be borne in mind that this design,

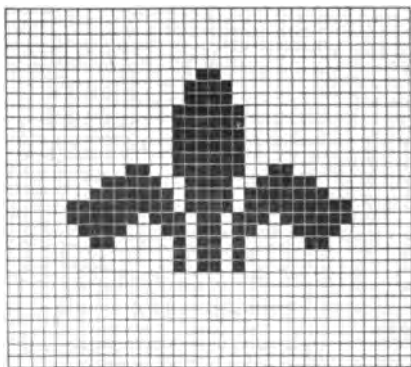


FIG. 23.

when woven, will present a somewhat ragged outline, as it must be formed in squares, and the scale of the figure must be altered to suit the size of the square on the design paper when it is produced. Fig. 23 shows a curved figure that is too small to be produced on design paper of the size shown, and the outline loses its curved effect, whereas in Fig. 24 the

enlargement of the same figure on the same sized design paper shows that the effect of the curved lines can be readily carried out. It is well to bear this in mind in all design work.

68. Brussels carpets are formed with two kinds of yarns, the body or ground of the carpet being made of hemp or

linen yarn, while the pile is of wool. The methods of spinning the yarns for this fabric, or any other class of goods, is precisely the same as has been described. The wool that

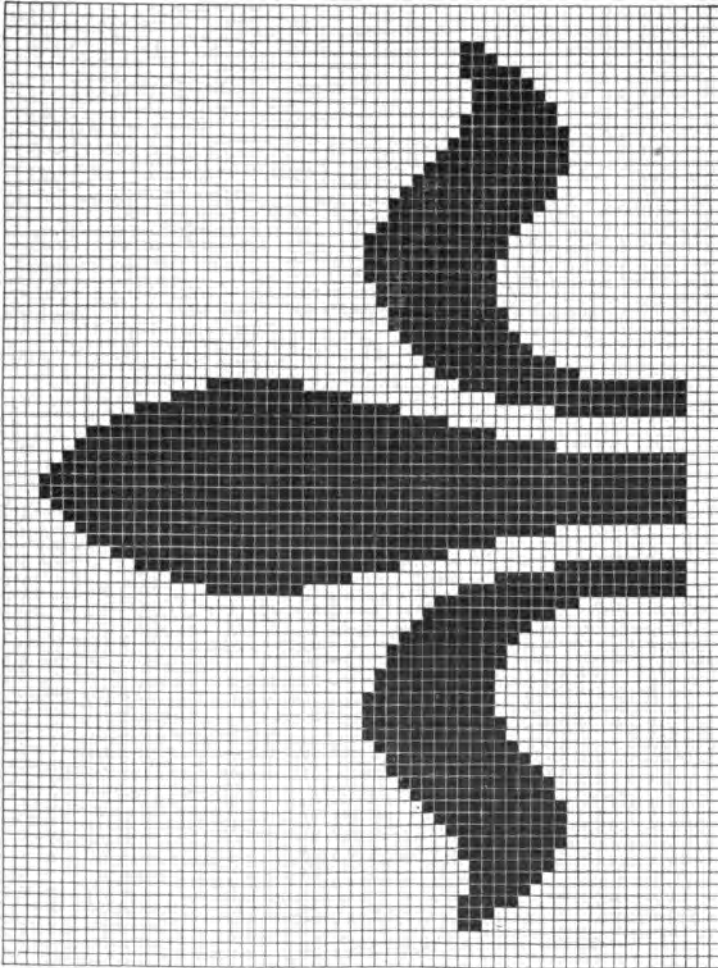


FIG. 24.

forms the surface of the carpet is carded and spun in precisely the same manner as the wool that goes into a dress fabric. It is dyed to the color desired to be reproduced and

wound on spools ready to go into the frame behind the loom.

69. There have been many suggestions for economy in the manufacture of carpets, and there are many carpets manufactured that present the same general appearance as Brussels but do not possess its great weight, owing to the lack of goods in the body. One form of these carpets is what is known as tapestry Brussels, wherein the threads are not left idly inside the fabric, and exist only where the pile is formed. In tapestry Brussels there is but one set of threads of pile warp and that is printed so as to form the pattern. The printing of the pile thread is effected by measuring out the length of a certain color required in a certain place to form the figure and that length of the thread is colored accordingly. It is then woven into the cloth as in ordinary velvet, and its pile brought to the surface. Following it on the same thread is another color required to form the ground on another portion of the figure. One printed thread thus serves for a number of colored ones, and it certainly is a very economical way of producing a colored carpet, but it is in no way so serviceable as the body Brussels that it is attempting to imitate.

70. Wilton carpet is the same as Brussels carpet, except that the pile is cut, and another formation of velvet carpets is effected by setting the pile surface into the carpet in sections just as it is required. Rugs are also formed in this way. The pile threads are neither warp nor weft, but are simply tufts set in where the figure is required. The colored threads are wound on long thin cylinders or rollers, possessing all the colors that are necessary to form one pick across the goods. A short length of these threads is then cut off and falls in place parallel with the warp in the loom, while the weft thread passes over them and binds them into the body of the carpet. They are then cut off and the roll passes on its way and makes room for another roll to bring the next set of threads. This makes a very bulky loom, as

there must be a separate roll for each pick across the loom for every repeat. In fact, there must be one roll for every Jacquard and in weaving long rugs it is not unusual to have three or four hundred of these rolls, each one of which is used but once, to form the pattern.

71. The designing of all these goods remains the same, however, the only difference being in the design papers themselves, which must be obtained for the particular purpose they are required. Ingrain carpet cannot be designed on Brussels paper, because it does not run the same number of threads to the inch, and when designs are laid out on paper care must be given that the proper subdivisions of the paper have been obtained.

A SERIES
OF
QUESTIONS AND EXAMPLES

RELATING TO THE SUBJECTS
TREATED OF IN THIS VOLUME.

It will be noticed that the Examination Questions contained in the following pages are divided into sections corresponding to the sections of the text of the preceding pages, so that each section has a headline which is the same as the headline of the section to which the questions refer. No attempt should be made to answer any questions or to work any examples until the corresponding part of the text has been carefully studied.

HISTORIC ORNAMENT.

(PART 1.)

EXAMINATION QUESTIONS.

(1) (a) How many types of people were there among the Egyptians? (b) Describe each.

(2) What natural types are found in Assyrian ornament?

(3) (a) How many moldings are there in Greek architecture? (b) Make a sketch of the outline of each molding, with its name under it. (These outlines should be about 1 inch high.)

(4) (a) Who were the Etruscans? (b) What nation was largely affected by their art? (c) What class of work did they excel in?

(5) (a) What two plant forms play a conspicuous part in Egyptian ornament? (b) Make a sketch of either one of them and describe the other one.

(6) How is Assyrian sculptured ornament inferior to the Egyptian?

(7) State the difference between *ornament* and *decoration*.

(8) (a) What is the winged disk? (b) What does it signify? (c) To what style of ornament does it belong? (d) Of what class of ornament is it?

(9) Make a sketch, about 2 inches high, showing the Assyrian rendering of the Egyptian lotus.

(10) (a) Where is the torus molding most frequently used? (b) Where is the echinus molding most frequently used? (c) Where is the cyma recta most frequently used?

(11) What is meant by the term *conventionalism*?

(12) (a) What is a scarabæus? (b) To what style of ornament does it belong?

(13) What great geographical differences were there between Greece and Egypt?

(14) What is the principal Greek building in the Doric order?

(15) (a) Should a floral design on a textile fabric be as close an imitation of the natural plant as is possible? (b) Why?

(16) Into what three classes is Egyptian ornament divided?

(17) Describe the character of the Greeks as a nation.

(18) Make a drawing 2 inches high of the Greek anthemion.

(19) How should color be used in decorative design?

(20) Describe Egyptian carved ornament.

(21) How does Greek art differ from Egyptian and Assyrian art?

(22) Make a drawing 2 inches high of the Greek lily.

(23) What was the origin of the fixed styles of ornament?

(24) Describe the preparation of a body for burial, as practiced among the ancient Egyptians.

(25) (a) In what does the beauty of Greek ornament lie most largely? (b) What characteristic that is prominent in Egyptian art does it lack?

(26) What is a guilloche?

(27) Of what advantage is the study of historic ornament?

(28) What is the scroll ornament, as seen in Egyptian art, considered to be symbolic of?

(29) To what do the leaves of the Greek flowers owe their form and shape?

(30) What is polychromy?

(31) What natural phenomenon had a marked effect on Egyptian ornament?

(32) Make a sketch, about 2 inches by 3 inches, of characteristic Egyptian ornament based on a combination of circles and ornamented with lotus-flower devices.

(33) What are the three great laws of nature observed by the Greek artist in his ornament?

(34) Describe the colors used, and the location of each, in the Grecian-Doric order.

(35) What peculiarity does Egyptian ornament possess over all other styles?

(36) (a) What colors were used in Egyptian ornament?
(b) Why was it necessary to use bright colors?

(37) (a) What are antefixæ; and (b) from what derived?

(38) (a) What are the three Greek orders? (b) What is the distinguishing characteristic of each?

(39) From what country was the ornament of Assyria borrowed ?

(40) What is a propylon ?

(41) How are the contours of Greek moldings profiled ?

(42) What objects standing in front of the Egyptian temples are characteristic of this style of art ?

(43) Draw a hyperbola.

HISTORIC ORNAMENT.

(PART 2.)

EXAMINATION QUESTIONS.

(1) What great religious difference existed between the Arabs and the Persians?

(2) What other nations carry out the same principles of surface decoration that we find in Indian art?

(3) In painted Byzantine ornament, of what does the ground almost universally consist?

(4) (*a*) Romanesque ornament in Eastern Europe was affected by the art of what other countries? (*b*) Into what style of art did the Romanesque develop under this influence?

(5) What is a modillion?

(6) What products of Persian design are still considered the finest in the world?

(7) What is the relationship that exists between Byzantine and Arabian ornament?

(8) What is the relative importance of sculpture in Byzantine and Romanesque art?

(9) Why is the distinction between Roman and Greek art so much more clearly marked than that between Byzantine and Romanesque?

(10) (a) What is the essential difference between the Roman-Corinthian order and the Roman-Composite order?
(b) For what reason was the Composite order originally designed?

(11) What are the characteristics of Celtic ornament?

(12) From what did the Moorish style spring?

(13) What are the restrictions of the Mohammedan religion in relation to decorative design?

(14) What is the relation of mosaic work and painted work in Byzantine and Romanesque art?

(15) (a) What is the earliest monument in the Byzantine style? (b) When was it built?

(16) What is the difference between the treatment of the acanthus leaves at the top of a Roman-Corinthian column and the lotus leaves at the top of an Egyptian column?

(17) What is the principal building in Moorish architecture?

(18) What peculiar personal characteristics of the oriental people affect the progress of their arts?

(19) (a) What building stands as prominently characteristic of Byzantine art as the Parthenon does of Greek art?
(b) For what is the building now used?

(20) What is the essential characteristic of all Roman ornament?

(21) What characteristic does Moorish ornament lack?

(22) To what can we trace the predominance of geometrical ornament in all Mohammedan designs?

(23) Aside from coloring, what is the first element of beauty in Chinese art?

(24) * Make a sketch of a Byzantine capital.

(25) At the time of its fall, how much of the continent of Europe did the Roman Empire cover?

(26) (a) What colors were used by the Moors, and (b) how were they arranged in wall treatment, to accord with natural laws?

(27) Describe the capitals of the columns in (a) the Early English period; (b) the Decorated period; (c) the Perpendicular period.

(28) * Make a sketch of Arabian geometrical ornament suitable for mosaic work.

(29) In Indian woven fabrics, what rules are observed under the following conditions: (a) How are colored grounds treated when gold ornaments are used, or where gold is used in large masses? (b) How is the ground treated when gold ornament is used alone? (c) When ornaments of one color are used on a ground of a contrasting color, what is the general rule? (d) When colored ornaments are used on a gold ground, how are they separated sharply from the ground?

(30) * Make a sketch of Byzantine running ornament or surface decoration.

(31) What conditions gave rise to the Romanesque style?

(32) * Make a sketch of Moorish geometrical interlaced ornament.

(33) What was the first Mohammedan nation to adopt European fashions in architecture?

(34) Why are examples of Byzantine art, as found on Greek soil, usually purer in style than others?

* All sketches are to be about 2 inches square.

(35) (a) In what year occurred the fall of Rome?
(b) How did this affect the art of Eastern and Western Europe?

(36) In what monuments was Roman art mostly expressed?

(37) In what class of work do we find the only ornament that is strictly Turkish in character?

(38) What object appears to have been maintained in the woven fabric of Indian manufacture concerning the definition of each object, and the effect of colored objects viewed at a distance?

(39) What are the characteristics of Byzantine carved ornament?

(40) What was the period of highest development in all architecture?

(41) What structural problem underlies the system of Romanesque design?

(42) Why was modification necessary when the Romans adopted the Greek orders?

(43) (a) Can the designs observable in Turkish carpets be considered characteristic Turkish designs? (b) Why?

(44) * Make a sketch of the capital of an early Romanesque column.

(45) (a) Name the five orders of architecture. (b) Which of these are essentially Roman?

(46) What are the most prominent colors in Turkish ornament?

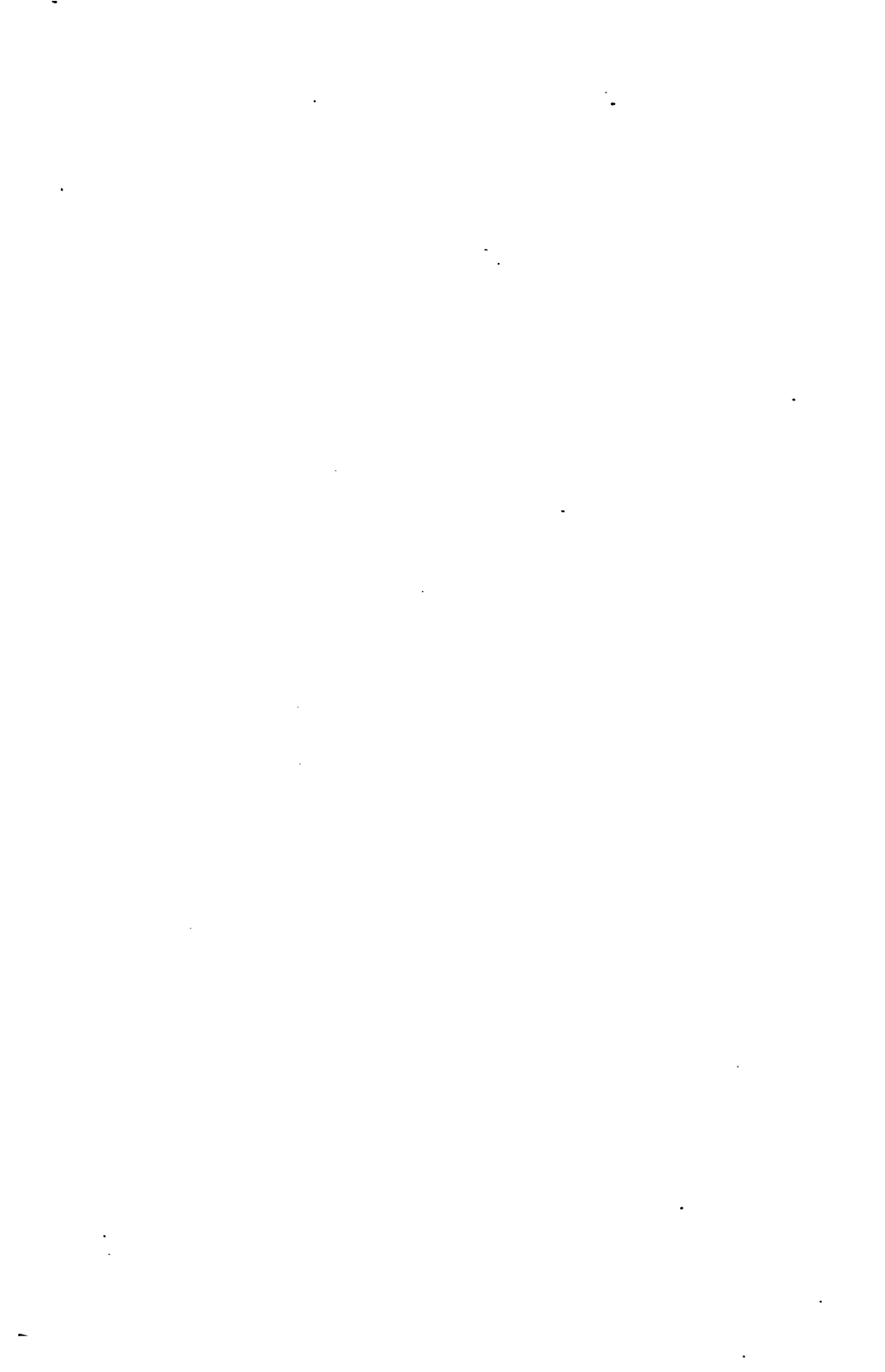
* All sketches are to be about 2 inches square.

(47) How do Byzantine mosaics differ from Roman mosaics?

(48) Why are Romanesque forms so simple?

(49) In what colors do modern Turkish ornament and ancient Turkish ornament differ?

(50) Give the characteristics (*a*) of the Greek-Ionic order;
(*b*) of the Roman-Doric order.



HISTORIC ORNAMENT.

(PART 3.)

EXAMINATION QUESTIONS.

(1) Into what four styles can French furniture be divided after the middle of the seventeenth century?

(2) What are the characteristic differences between the feudal castle and the Renaissance château?

(3) What effect did the invention of printing and the printing press have on the development of Renaissance art?

(4) Execute your name in letters of the Old English alphabet.

(5) (a) Make a sketch of some heraldic device characteristic of Francis I period; (b) Henry II period.

(6) Describe the furniture of the Louis XIV period.

(7) What is the largest and most important of the French châteaux?

(8) What is meant by (a) basso rilievo? (b) mezzo rilievo? (c) alto rilievo? (d) By whom were they first practiced?

(9) Describe the decorations of the molded work and panels in the three periods of English architecture.

(10) Make a sketch, 2 inches square, showing an example of Celtic interlaced work.

- (11) Describe the furniture of the Louis XV period.
- (12) What idea did the French artists conceive of the Romans' use of the Greek orders?
- (13) What great painting did Michael Angelo execute in 1541?
- (14) Describe the diapers and wall decorations of the three periods of English art.
- (15) Where do we find the purest forms of Gothic ornament?
- (16) Describe the furniture of the Louis XVI period.
- (17) What was the heraldic device of Francis I?
- (18) What two famous statues did Michael Angelo design for Pope Julius II?
- (19) Print the title "Historic Ornament" in letters of the Medieval Roman alphabet.
- (20) What are the characteristics of Early English architecture?
- (21) Describe the interior decorations of the Louis XVI period.
- (22) What was the heraldic device of Louis XII?
- (23) What are the characteristics expressed in all of Michael Angelo's works?
- (24) What are the three periods of Gothic architecture in France?
- (25) What are the three periods of English-Gothic ornament?
- (26) In what way did Albert Durer influence the tastes in German Renaissance?

(27) What heraldic device was sometimes used by Anne of Brittany?

(28) What building was Michael Angelo employed upon as architect when he died?

(29) What other buildings than churches formed a large portion of the Gothic architecture of the thirteenth century?

(30) What are the characteristics of the Decorated period of English architecture?

(31) (a) What monument, in England, marks the introduction of Renaissance into that country? (b) What year was it erected?

(32) In French heraldry, of what was the dolphin indicative?

(33) Why was the transition from Gothic to Renaissance much more rapid in France than anywhere else?

(34) Describe the feudal system.

(35) What are the characteristics of the Perpendicular period of English-Gothic architecture?

(36) What Dutch architect designed a number of college gates in England?

(37) What animal was used in heraldic devices, indicative of Anne of Brittany?

(38) Into what three periods is French Renaissance divided?

(39) How were the rooms heated in the early feudal castles?

(40) What are the distinguishing characteristics of Italian-Gothic architecture?

(41) What are the characteristics of Elizabethan ornament?

(42) What two palaces near Paris became popular with the royal family toward the decline of the Renaissance?

(43) What class of buildings best expresses the transition from Gothic to Renaissance in French architecture?

(44) Describe the influences that affected Renaissance architecture in Italy, France, and England.

(45) What is the purpose in studying historic ornament?

ELEMENTS OF ORNAMENT.

EXAMINATION QUESTIONS.

(1) (a) In the application of wings to the human figure, where did the Egyptians attach them? (b) Where did the Assyrians attach them? (c) Which of these methods survives at the present day?

(2) Make a sketch of (a) Maltese cross; (b) Greek cross; (c) cross of St. Andrew; (d) Latin cross.

(3) Sketch a conventionalized form of Greek foliated ornament and the natural growth from which it is derived.

(4) What is meant by *unity in design*?

(5) In drawing the human figure, how should the masses be disposed?

(6) Describe the dragon and its combined characteristics.

(7) What is included under industrial ornament?

(8) What three principles in design are represented by the oval?

(9) What are the supposed characteristics of the Greek sphinxes?

(10) What were the general measurements of the human figure according to Greek proportions?

(11) What is the simplest form of geometrical elements?

(12) Describe the relation between applied ornament and appearance of strength in ancient pottery.

(13) What is the difference between the Greek sphinx and the Egyptian sphinx ?

(14) Draw the symbolic monogram of the name of Christ, composed of the two Greek letters *chi* and *rho*.

(15) Make a sketch of (a) the morning-glory leaf treated realistically; (b) the morning-glory leaf treated naturally; (c) the morning-glory leaf treated conventionally.

(16) Make a sketch of four squares, measuring 2 inches on each side, all subdivided on a different system, as explained in Art. 5.

(17) What two separate ideas are associated with symbolism ?

(18) Describe the difference in treatment of the human figure when used as a support, in Egyptian art and Greek art.

(19) (a) Describe the chimera. (b) From what was the idea derived ?

(20) What is included under geometrical ornament ?

(21) (a) What is inventive ornament ? (b) Of whom is it characteristic ?

(22) What is the centaur, and from what is it derived ?

(23) (a) What is the meaning of the botanical term inflorescence ? (b) Make a sketch showing its application in design.

(24) Make a sketch where the daisy is applied to geometrical ornament in two ways: (a) conventionally; (b) naturalistically.

(25) Why is conventionalism necessary in decorative design ?

(26) (*a*) Describe the head of Medusa. (*b*) What is the legend concerning this head ?

(27) Draw a conventionalized border composed of insect forms, or ideas derived from insect forms.

(28) What was the origin of the cartouch ?

(29) Draw a leaf and a flower, the outline of which shall be based on a geometrical figure.

(30) What is included under architectural ornament ?

(31) What abstract form seems to pervade all nature ?

(32) What is included under animal ornament ?

(33) (*a*) What two kinds of conventionalism do we find in historic ornament ? (*b*) Describe each.

(34) (*a*) Describe the imaginary animal known as the griffin. (*b*) What does it symbolize ? (*c*) Describe the difference between the conventional idea and the conventionalized facts in this figure.

(35) Describe the principles of symmetry and radiation.

(36) (*a*) Under how many divisions can the elements of ornament be classified ? (*b*) Name them.

(37) Make sketches about 2 inches high illustrating bisymmetry, trisymmetry, and multisymmetry.

(38) In designing an iron railing, what characteristic should greatly influence the form and proportion of its lines ?

(39) What two faculties of the mind lie at the origin of decorative art ?

(40) Make a sketch of a cartouch and also of the form of the sheet of metal necessary to produce it.



PRACTICAL DESIGN.

EXAMINATION QUESTIONS.

- (1) What is a drop pattern?
- (2) Make a sketch, 6 inches square, the design of which repeats on each side of the diagonal and consists of an arrangement of eight equal triangles.
- (3) Make a drawing of a rug where the corner ornament of the central panel merges into and is continuous with the border.
- (4) What is the difference between repetition and alternation?
- (5) What advantages are obtainable in the application of drop patterns in roll carpets?
- (6) What consideration must be observed as to the character of borders used (*a*) on table cloths? (*b*) on rugs?
- (7) Make a drawing for repeating ornament based on the lozenge shape, or diamond, the theme of which shall be the ivy.
- (8) Make a drawing of a rug wherein the corner ornament of the central panel is independent of the border.

§ 7

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(9) Make a design that expresses the principles of contrast and variety.

(10) What is a turn-over pattern ?

(11) Into what two classes are borders divided ?

(12) Describe three methods of laying out designs for lace curtains and illustrate same with original designs.

(13) Make two drawings demonstrating the principles of symmetry and balance.

(14) What is the advantage of familiarity with several systems of constructing patterns ?

(15) What is the purpose of an angle ornament or corner ?

(16) What considerations must be observed in the designing of borders ?

(17) What principles are involved in the production of good repeating patterns ?

(18) (*a*) What is the unit ? (*b*) What three geometrical figures lend themselves readily to the formation of units ?

APPLIED DESIGN.

(PART 1.)

EXAMINATION QUESTIONS.

(1) Make a drawing, 4 in. \times 6 in., representing a panel decorated in the style of surface work known as diapering, and introduce the fleur-de-lis as an element in this decoration.

(2) In using stripe materials for hangings and other decorations, what considerations should be given to the character and directions of the stripes?

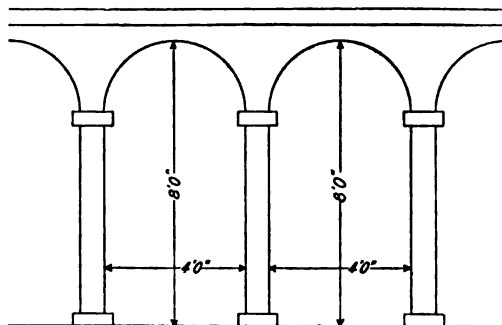
(3) (a) Make a drawing, 4 inches square, showing a design and the principle of the design block from which wall paper, on a lozenge pattern, is printed. (b) Make another drawing of this same design, on a differently proportioned lozenge, arranged for a drop pattern.

(4) (a) In how many ways may a frieze be decorated? (b) Make a sketch, 2 inches in width, of each of these forms and have each characteristic of some architectural style.

(5) Make a design for a drinking cup, suitable to be worked in silver, and execute on its surface a style of ornament suitable to its purpose.

(6) Make a design for the side wall of a room, showing both dado and frieze, and execute same in the Moorish style, observing proper treatment for each detail.

(7) Draw the accompanying figure to a scale of 1 inch to the foot, and ornament the spandrels with a decoration



characteristic of some architectural style in harmony with the columns and other details.

(8) (a) What is the meaning of spotting and powdering? (b) What is the difference between spotting and powdering? (c) Make a design, 4 in. \times 6 in., for a panel that will be an example of both spotting-and-powdering work.

(9) In what way does the weight and quality of the goods affect the style of the pattern in textiles?

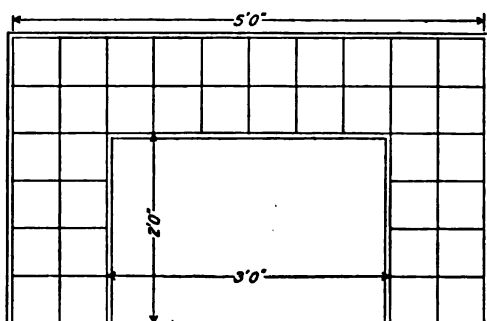
(10) (a) When the scale of a pattern of a wall decoration is small, how should its color rendering be considered? (b) What effect on the color rendering does increase of scale bring about?

(11) Design a corner ornament for a frame that will possess the most desirable characteristics of a corner ornament.

(12) What is a hanap?

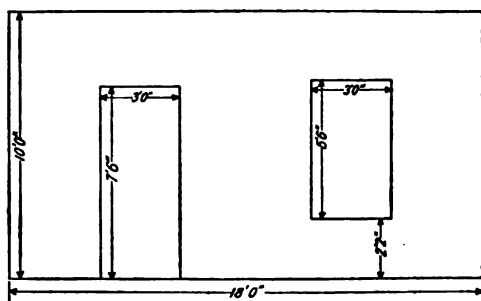
(13) In laying out ornament on a surface, what consideration must be given the structural lines relative to the geometrical shape of the surface?

(14) The accompanying figure is a fireplace opening surrounded by tiles; draw this out at a scale of $1\frac{1}{4}$ inches to the foot, and sketch in a design for each tile, so that the entire work will present a surface characteristic of checker design,



or a combination of checkering and diapering, based on squares, and see that the structural lines are properly placed in each tile.

(15) The accompanying figure represents the side wall of a room; make a drawing of it, on a scale of $\frac{1}{4}$ inch to the foot, according to the dimensions here given, and decorate



the wall in any suitable manner, giving a description of the method of treating it and the style intended.

(16) What character of patterns are best suited to block printing?

(17) In what four ways may pilasters be treated?

(18) Make four drawings, each 4 inches square, applying some floral form to a wall-paper pattern based on the four systems of repeat illustrated in Art. 12.

(19) Make two designs for wall-paper patterns based on a conventional rendering of the morning-glory vine, or some similar type, one of which will show clearly the geometrical construction on which it is based, while the other will be of such a character as to make it difficult to show the geometrical plan on which it is based after the guide lines have been removed.

(20) (a) When should pilasters be introduced into the wall treatment of a room? (b) What is the objection to the use of pilasters as a wall treatment?

(21) What relation to wall decoration does the frieze bear?

(22) What character of pilaster requires a conventional rendering in its decoration, and what character of pilaster will permit a more naturalistic rendering?

(23) What are the standard widths of wall papers?

(24) Make a drawing of a panel, 4 in. \times 6 in., wherein the center contains a well balanced design around which a border is designed in harmony with it but in no way conflicting with its interest.

(25) What characteristics must be sought in the designing of carpets, so as to avoid harshness?

(26) What is a tankard?

(27) What five general arrangements of ornament are there in surface work?

(28) How may the apparent feeling of ceiling height be altered in a room without making any structural change?

(29) How should the decoration of a frieze compare with the rest of the wall?

(30) What is the first consideration in the decoration of a ceiling?

(31) What are the uses of borders in decoration and design?

(32) Make a border, 2 inches wide, which will be a suitable design for a parquet floor, composed of two or more colored woods and arranged to accomplish the most desirable characteristics of this style of design.

N. B.—All drawings are to be made on sheets of paper 8 in. \times 10 in.



APPLIED DESIGN.

(PART 2.)

EXAMINATION QUESTIONS.

- (1) (a) In a plain weave where the weft threads are heavier than the warp, what will be the effect in the finished goods? (b) Why?
- (2) Describe in detail the method of weaving Brussels carpet.
- (3) What is the direct effect of the twist of the threads in the texture of the goods in a woven fabric?
- (4) What is a twill?
- (5) What yarn is used in the body, or ground, of Brussels carpet?
- (6) Describe the process of making woolen yarn.
- (7) Describe the system on which satins are woven.
- (8) Describe the method of weaving tapestry Brussels carpet.
- (9) What is the difference between wool and worsted?
- (10) Make a sketch of a cross-section of a double-faced cloth with one warp and two wefts.
- (11) What is Wilton carpet?
- (12) What are the characteristics of (a) wool fibers? (b) silk fibers?

(13) (a) Make an original design on squared paper for a simple twill. (b) Make a sketch of a cross-section through this design, the second pick from the top.

(14) What is the Jacquard machine?

(15) Describe the method of making (a) silk thread; (b) linen thread.

(16) Make a sketch of a cross-section of the goods woven according to the pattern in Fig. 12, (a) on the fourth pick from the top; (b) on the fourth pick from the bottom.

(17) On what is the warp wound in the loom?

(18) What is accomplished by the use of the carding machine?

(19) (a) Make an original design for a spot pattern. (b) Make a section showing the weave of the goods through the center of the spot. (c) Make a section showing the weave of the goods between the spots.

(20) On what does the wearing quality of a fabric depend?

(21) Describe the operation of the spinning mule.

(22) Make a section showing the weave (a) through Fig. 19, five picks from the bottom of the spot; (b) through Fig. 20, four picks from the bottom of the spot.

(23) What are the first considerations in laying out a design for a textile fabric?

(24) Describe the spinning of carpet yarn.

(25) (a) What is the gilling machine? (b) What is its purpose?

INDEX

NOTE.—All items in this index refer first to the section (see the Preface) and then to the page of the section. Thus, "Lotus 8 26" means that lotus will be found on page 26 of section 8.

A		Sec. Page		Sec. Page	
Abacus	4	8	Application of wings	6	51
Acanthus, Roman	4	31	Applied Design	8	1
Adaptability of decoration	8	48	Arabian and Persian art compared	4	78
Adaptation of architectural forms	6	36	" art	4	69
Adherence to old designs	5	57	" " Arrangement of ornament in	6	29
Albert Durer	5	51	" coloring	4	74
Alhambra	4	81	" " Mohammedanism in	4	70
Alphabet, Antique Egyptian	5	68	" ornament	4	69
" French Roman	5	71	" " Development of	4	69
" Gothic	5	75	Architectural development, Zenith of	4	115
" Heavy antique Egyptian	5	69	" elements, Association of	6	40
" Light antique Egyptian	5	65	" elements in design	6	35
" Medieval Roman	5	69	" forms, Adaptation of	6	36
" Old English	5	79	" orders	3	58
Alternation	7	1	" ornament	6	34
Alto rilievo	5	7	Architecture, Chinese, Scarcity of	4	61
Ancient art	3	9	" Classic	4	2
" " Conventionalism in	6	25	" Conditions influencing	3	5
" castles, Heating of	4	126	" Five orders of	4	2
" " Mode of living in	4	126	" Greek	3	54
" Ornament	3	9	" Influences of	3	4
" pottery decoration	6	15	Architrave	4	6
Animal elements in design	6	43	" Ionic	4	13
" forms combined with details of human figure	6	61	Arrangement of details	3	9
" forms, Conventionalizing	6	44	" " lines	6	4
" forms, Difficulty of adapting	6	47	Arrangements of ornament in surface work	8	11
" forms in Celtic ornament	4	96	Art, Ancient	3	9
" ornament	6	34	" and literature, Italian	5	5
Annulets	4	5	" Assyrian	3	47
Antefixæ	3	76	" " Development of	3	47
Anthemion	3	67	" Byzantine	4	39
Antique art, Revival of, in England	5	55	" Celtic	4	95
" Egyptian alphabet	5	68	" Chinese	4	59
" " Heavy	6	69	" " Standard forms in	4	62
" " Light	5	65			
Antiquity of Egyptian ornament	3	15			
Apophyge	4	12			

	Sec.	Page		B	Sec.	Page
Art, Classic	4	1	Ball-flower ornament	4	101	
" "	3	52	" pattern	7	31	
" Comparison of Persian and			Base, Attic	4	12	
Arabian	4	78	" Corinthian	4	16	
" " Persian and			Bases, Greek	3	59	
Indian	4	79	Basis of a design, Geometrical . .	7	6	
" Conventionalism in ancient .	6	25	Basket weave	9	15	
" Decorative	3	6	Basso rilievo	5	7	
" Egyptian	3	14	Beasts, Imaginary	6	44	
" Etruscan	3	77	Beauty, Construction allied with .	6	35	
" French Gothic	4	116	Birds and running ornaments . . .	6	48	
" " Heraldry in	5	34	Bisymmetry, Definition of	6	15	
" Gothic	4	99	Blending of colors in Moorish or-			
" " Evolution of	4	99	nament	4	91	
" " in Italy	4	106	Blois, Château de	5	28	
" " Influence of religion in .	4	99	" Staircase of Château de . . .	5	31	
" Greco-Roman	3	79	Border and filling, Uniformity of			
" Greek	3	52	repeat in	7	39	
" Indian	4	64	" applied to picture in form			
" " Lack of progressive-			of frame	8	29	
ness in	4	64	Borders, Classification of	7	46	
" Influence affecting different			" corners, and stripes	7	39	
styles of	5	56	" for hangings and table			
" Italian, Roman influences on .	5	6	covers	7	47	
" Japanese	4	59	" " rugs and floor cov-			
" "	4	63	erings	7	48	
" Moorish	4	80	" " wall paper	8	29	
" " Construction and dec-			" Greek	7	47	
oration in	4	83	" Link	7	46	
" " Derivation of	4	80	" One-piece	7	39	
" " Primary colors in	4	85	" Vertebrate	7	46	
" Oriental	4	59	Botanical principles in design . .	6	42	
" Persian	4	78	Bourbon period	5	25	
" Pompeian	3	79	Brocades, Italian	7	54	
" Renaissance	5	1	Brush decoration of pottery . . .	6	23	
" " in Italy	5	3	Brussels carpet	9	27	
" " Origin of	5	1	" "	9	29	
" Romanesque	4	83	" " Body	9	34	
" Sculpture in Byzantine	4	58	" " Tapestry	9	34	
" " Romanesque	4	58	Byzantine art	4	39	
" Turkish	4	76	" " Ornamental influ-			
" Western	4	95	ence in	4	39	
Artificial elements	6	34	" " Sculpture in	4	58	
Asiatic ornament	4	59	" ceiling decoration	4	47	
Assemblage of details to secure			" decoration	4	47	
unity	6	3	" ornament	4	39	
Assembly, Hall of	3	17	" " Ingenuity of	4	55	
Assyrian art	3	47	" " Origin of	4	39	
" " Development of	3	47	" style, Examples of	4	42	
" method of attaching						
wings to human figure .	6	64				
" ornament	3	47				
" sculpture	3	48				
Athena Polias, Temple of	3	70				
" " "	4	9				
Attic base	4	12				

INDEX

ix

	<i>Sec. Page</i>		<i>Sec. Page</i>
Capitals, Early French	4 116	Characteristics of the Greeks . . .	3 52
" Flamboyant	4 117	" " Turkish orna- ment	4 76
" perpendicular, Charac- teristics of	4 110	Château de Blois	5 28
" Rayonnant	4 117	" " " Octagonal stair- case in	5 31
Carding machine	9 7	" " " Wall decoration in	5 42
Cards, Jacquard	9 26	Châteaux and castles	5 26
Carpet, Brussels	9 29	Checking	8 11
" Designing of	9 35	" 	8 17
" designs, Drop pattern in .	7 15	Chimera, The	6 46
" Softness of out- line in	8 39	Chinese architecture, Scarcity of .	4 61
" " Width of repeat in .	7 15	" art, Standard forms in . .	4 62
" Waste in cutting	7 17	" coloring	4 62
" Wilton	9 34	" ornament	4 59
Cartouch, The	6 30	" " and idealism	4 60
Castle of Coucy	4 123	" " Primitiveness of . .	4 59
Castles, ancient, Heating of . . .	4 126	Christ, Monogram of	6 41
" " Mode of living in . .	4 126	Church, Influence of	4 34
" and châteaux	5 26	" of St. Mark	4 51
Cathedral of Monreale	4 55	Class of ornament	3 30
Canicull	4 16	Classes of Egyptian ornament . .	3 30
Cavetto	3 63	Classic architecture	4 2
Ceiling decoration	8 34	" art	3 52
" " Byzantine	4 47	" " 	4 1
Ceilings, Treatment of arched . .	8 38	" moldings	3 60
" " " flat	8 38	" ornament	3 52
Celtic art	4 95	" " 	4 1
" ornament	4 95	" style, Revival of	5 2
" " Animal forms in . . .	4 96	Classification of borders	7 46
" " Characteristics of . .	4 86	" " elements	6 34
" " Intricacy of	4 97	Cleopatra	8 34
" " Origin of	4 95	Cloth, Plain, ornamented with loz- enge-shaped spot	9 22
" " Symbolism in	4 98	Cloths, Double	9 18
Centaur	6 66	Color	8 8
Chalice	8 46	" Use of, in pile fabrics . . .	9 29
Character of threads	9 4	Coloring, Arabian	4 74
Characteristics of a design	7 5	" Chinese	4 62
" " Celtic ornament . . .	4 96	" Egyptian	3 46
" " decorated cap- itals	4 110	" in Moorish ornament . . .	4 89
" " early English capitals	4 109	" " wall paper	8 25
" " Elizabethan orna- ment	5 54	" Moorish, System of	4 90
" " Indian orna- ment	4 65	" Rules of, in Indian fabrics .	4 65
" " Moorish orna- ment	4 81	Colors, Blending of, in Moorish ornament	4 91
" " Oriental people . . .	4 59	" of Egyptians	3 46
" " perpendicular capitals	4 110	" Relation of	6 7
" " Persian orna- ment	4 78	" Reversion of	6 7
" " Roman orna- ment	4 31	Column, Tuscan	4 20
		Combination of elements	3 3
		Combing	9 10
		Comparison of Egypt and Greece .	3 52
		" " Greek and Roman orders	4 20

	<i>Sec.</i>	<i>Page</i>		<i>Sec.</i>	<i>Page</i>
Comparison of Indian and Persian art	4	79	Cornice	4	7
" " Persian and Arabian art	4	78	Corona	4	7
Composite order	4	30	Cotton fibers	9	6
Composition	6	1	" yarn	9	12
Conditions influencing architecture	3	5	Creatures, Fabulous	6	65
Conic sections	3	60	Cross, Greek	6	41
Consideration of purpose in design	6	32	" Latin	6	41
Consistency in design	3	7	" Maltese	6	41
" of Egyptian ornament	3	29	" Saint Andrew's	6	41
" " Moorish ornament	4	87	Curtain design, Lace	7	44
Construction allied with beauty	6	35	Curved lines, Emphasis of	8	3
" and decoration in Moorish art	4	83	Cutting carpets, Waste in	7	18
" of design, Selection of system of	7	25	Cyma recta	3	63
" " Moorish geometrical ornament	4	92	" reversa	3	63
" Systems of	7	24	Cymatum	4	8
Constructive origin of decorative art	6	17	D		
" ornament	3	31	Damasks, Size of repeat in	7	40
Continuity of lines	8	5	De Thou	7	72
Contrast and variety	7	2	Decorated capitals, Characteristics of	4	109
" variety, and repetition	6	13	" period	4	100
Conventional ornament	6	28	Decorating, Effects of vertical and horizontal	8	21
" treatment of nature	6	31	Decoration, Adaptability of	8	38
Conventionallism	3	6	" Ancient pottery	6	15
" and realism	6	30	" and construction in Moorish art	4	83
" Egyptian	6	25	" Arabian	4	72
" Explanation of	6	12	" Ceiling	8	35
" Greek	6	25	" Elements of	3	2
" in ancient art	6	25	" Floor	8	38
" " Moorish ornament	4	88	" General rules of surface in	3	8
" Influence of	8	2	" Meaning of	3	1
" Kinds of	6	25	" Principles of	3	2
" Necessity of	6	12	" Surface	6	3
" of Egyptian ornament	3	29	" Geometrical basis of	8	8
" facts	6	25	Decorations, Painted Roman	4	32
" principles or ideas	6	25	Decorative art	3	6
" Taste in	6	32	" Constructive origin of	6	17
Conventionalizing a plant form	6	30	" ornament	3	30
" animal forms	6	44	" "	3	35
Corinthian base	4	16	" theory exhibited by the savage	3	12
" capital	4	15	Defective design	7	7
" order	3	64	Defects, Remedy for	7	7
" " Roman	4	27	Definition of bisymmetry	6	15
Corner ornament	7	42	" inflorescence	6	43
" "	7	50	" inventive ornament	6	13
Corners	8	32	" multisymmetry	6	15
" borders, and stripes	7	39	" trisymmetry	6	15
			" unit	7	6

INDEX

xi

	<i>Sec. Page</i>		<i>Sec. Page</i>
Derivation of Moorish art	4 80	Diapering	8 11
Design, Adherence to old	5 57	Diapers, Early English	4 113
" based on the diamond and		" French	4 119
arranged as a center tie	7 38	Disk, Winged	3 27
" based on the parallelo-		Distribution of masses	8 5
gram	7 34	Divinity, Egyptian symbol of	6 40
" Botanical principles in	6 42	Double cloths	9 18
" Characteristics of a	7 5	Dragon, The	6 46
" Consistency in	3 7	Donatello	5 6
" Defective	7 7	Doric entablature	4 6
" Enclosing rectangle of a	7 14	"	4 24
" Evolution of	6 17	" order	3 64
" for fabric, Appropriate-		Drawing designs, Planning and	7 18
ness of	9 1	Drinking cup, Development of the	8 42
" " " Laying out	9 20	Drop pattern	7 12
" Human figure used in	6 34	" " in carpet design	7 15
" in hanging fabrics, Propri-		" " wall papers	8 22
ety of	8 18	" patterns, Striped effect in	7 19
" Natural forms in	6 28	Durer, Albert	5 51
" Noblest element of	6 56	Dutch influence in English Renais-	
" of the sixteenth century,		sance	5 58
Gothic	7 15		
" Orders of	3 58		
" Planning the	7 5		
" Practical	7 1		
" Principal feature in a	7 9		
" Principles involved in			
practical	7 1		
" Simple spot	7 26		
" Symmetrical	7 14		
" Unity in	6 1		
" Wall-paper	8 22		
Designing, Advantage of numer-			
ous methods in	7 24		
" of carpets	9 35		
Designs, Variety of, from same			
elements	6 11		
Details, Arrangement of	8 9		
" Assemblage of, to secure			
unity	6 3		
" German Gothic	4 121		
Development of Arabian orna-			
ment	4 69		
" " Assyrian art	3 47		
" " drinking cup	8 42		
" " fireplace	5 33		
" " flowers	6 27		
" " leaves	6 27		
" " Romanesque			
style	4 33		
Devices, Symbolic	3 3		
Diamond, Design based on the,			
and arranged as a			
center tie	7 38		
" Turn-over pattern			
based on the	7 38		

E

Early English capitals, Character-			
istics of	4 109		
" " diapers	4 113		
" " period	4 100		
" " spandrels	4 112		
" French capitals	4 116		
" " diapers	4 119		
" " period	4 116		
Echinus	3 63		
Effect of invention of printing	5 5		
" " Mohammedan religion			
on light and shade	6 7		
" " repeat	7 11		
" " traditional styles	3 11		
Egypt and Greece, Comparison of	3 52		
Egyptian alphabet, Antique	5 63		
" " Heavy antique	5 69		
" " Light antique	5 65		
" art	3 14		
" coloring	3 46		
" colors	3 46		
" conventionalism	6 25		
" method of attaching			
wings to human figure	6 64		
" ornament	3 14		
" " Antiquity of	3 15		
" " Classes of	3 30		
" " Consistency of	3 29		
" " Conventional-			
ism of	3 29		
" " Influence of			
Nile on	3 14		

	<i>Sec. Page</i>	<i>F</i>	<i>Sec. Page</i>
Egyptian ornament, Influence of religion on	3 16	Fabric, Laying out design for . . .	9 20
" sphinx	6 45	" Ornamentation of, in checker pattern	9 21
" temple	3 17	Fabrics, Appropriateness of design for	9 2
" Interior of	3 19	" Figuring of surface of, in their pile	9 27
" Plan of	3 22	" Hanging	8 18
Eighteenth century, Italian design of the	7 35	" Indian, Rules of coloring	4 65
Element of design, The noblest	6 56	" Laying out ornamentation of	9 22
Elements, Animal, in design	6 43	" Ornamentation of	9 22
" Architectural, in design	6 35	" Pile	9 20
" Artificial	6 34	" "	9 27
" Classification of	6 34	" " Ornamentation of	9 28
" Combination of	3 3	" " Use of color in	9 29
" Geometrical, in design	6 34	" Plain	9 18
" Industrial, in design	6 40	" Purposes of	9 1
" Introduction of geometrical	7 35	" Textile	9 1
" Natural	6 34	" Warp pile	9 28
" " in design	6 41	" Weft pile	9 27
" of decoration	3 2	Fabulous creatures	6 65
" ornament	6 1	Fall of Roman Empire	4 33
Elizabethan ornament, Characteristics of	5 54	Fashion, Consideration of	7 4
Ellipse	3 61	" Influence of	7 27
Emblems, Prehistoric	6 39	Faults in turn-over method, Elimination of	7 22
Emphasis of curved lines	8 3	Feathers	6 52
" structural lines	8 2	Feature in a design, Principal	7 9
Empire period	5 25	Felting	9 5
England and Holland, Political ties of	5 53	Feudal system	4 121
" Introduction of Renaissance art into	5 3	Fibers, Cotton	9 6
" Introduction of Renaissance art into	5 52	" Flax	9 6
" Revival of antique art in	5 55	" Silk	9 6
English and German Gothic	4 100	" Wool	9 4
" Renaissance	5 51	Fiefs	4 122
" " Dutch influence in	5 53	Figure design, Fundamental principles of	6 59
Entablature, Doric	4 6	" Human	6 56
" Roman Doric	4 24	Figuring surface of fabrics in their pile	9 27
" Tuscan	4 20	Fillet	3 63
Epitithidas	4 5	Fireplace, Development of	5 33
Erechtheum	3 71	Fishes in ornament	6 54
Etruscan art	3 77	Fitness	7 4
" ornament	3 77	" "	8 1
Evolution of design	6 17	" of ornament	6 16
" " Gothic art	4 99	" " pattern in wall paper	8 26
" " " ornament	4 108	Five orders of architecture	4 2
Ewer	8 46	Flatness, Necessity of, in floor decoration	8 33
Examples of Byzantine style	4 42	Flamboyant capitals	4 117
Explanation of conventionalism	6 12	" period	4 116
Expression of taste in savage ornament	3 11	Flax fibers	9 6
		" yarn	9 12
		Fleur-de-lis	4 128

	<i>Sec. Page</i>		<i>Sec. Page</i>
Floor coverings and rugs, Borders		Geometrical forms in nature . . .	6 28
for	7 48	" ornament	6 34
" decoration	8 38	" ornament, Moorish, Construction of . . .	4 92
" " Necessity of flat- ness in	8 38	" Union of, with natural ornament	6 24
Floral forms combined with de- tails of human figure	6 61	German and English Gothic . . .	4 100
Flowers, Development of	6 27	" Gothic details	4 121
Foliated terminations in Italian Renaissance	5 13	" Renaissance	5 51
Fontainebleau	5 47	" Renaissance, Influence of Italian art in	5 51
Forms, Vegetable	6 41	Ghiberti	5 7
France, Introduction of Renais- sance art into	5 3	Giaco Tatti Sansovino	5 22
French art, Heraldry in	5 34	Gilling machine	9 10
" conception of Roman ideas	5 29	Globe, Winged	3 27
" furniture, Lack of sym- metry in	5 49	Gothic alphabet	5 75
" " Style of	5 48	" art	4 99
" Gothic art	4 116	" " Evolution of	4 99
" Renaissance	5 24	" " in France	4 116
" " Periods of	5 24	" " Italy	4 106
" " Rapidity of transition of	5 24	" " Influence of religion in . .	4 99
" " style, Purity of	5 4	" design of the sixteenth cen- tury	7 15
" Roman alphabet	5 71	" English and German . . .	4 100
" window tracery	4 105	" forms, Italian aversion to .	5 6
Fret	3 37	" frieze	8 28
Frets	6 34	" German details	4 121
Frieze	4 6	" Misinterpretation of . . .	4 121
" Gothic	8 28	" ornament	4 99
" Greek	8 28	" " Evolution of	4 108
" Renaissance	8 28	" " Origin of	4 39
Friezes	8 26	Greco-Roman art	3 79
Furniture, French, Lack of sym- metry in	5 49	" " ornament	3 79
" " Style of	5 48	Greece and Egypt, Comparison of	3 52
G		Greek and Roman orders, Com- parison of	4 20
General rules of surface decora- tion	3 8	" architecture	3 54
Geometric constructions, Abolish- ing fundamental	8 9	" art	3 52
" constructions, Retain- ing fundamental	8 9	" bases	3 59
Geometrical bases, Variety possi- ble on certain	7 26	" borders	7 47
" basis of a design	7 6	" conventionalism	6 25
" " " surface decora- tions	8 8	" Corinthian order	4 14
" considerations in Ap- plied Design	8 1	" cross	6 41
" elements in design	6 34	" Doric order	4 3
" " Introduction of	7 35	" frieze	8 28
		" lily	3 67
		" orders	4 2
		" ornament	3 52
		" " Representative types of	3 56
		" sculpture	3 56
		" sphinx	6 51
		" "	6 66
		Greeks, Character of the	3 52
		Griffin	6 43
		Grouping, Study of	6 6

	Sec.	Page		I	Sec.	Page
Growth	7	4	Idealism and Chinese ornament	4	60	
Gulloche	3	70	Imaginary beasts	6	44	
Guttæ	4	8	Imitation and invention	6	13	
H			Indian and Persian art compared	4	79	
Hackling	9	12	" art	4	64	
Hagia Sophia	4	40	" " Arrangement of ornament in	6	29	
Hall, Hypostyle	3	17	" " Lack of progressiveness in	4	64	
" " at Karnak	3	23	" fabrics, Rules of coloring	4	65	
" of assembly	3	17	" ornament	4	64	
Hanap	8	44	" " Characteristics of	4	65	
Handles, Consideration of, in designing vases and cups	8	46	Industrial elements, Association of, with architectural	6	40	
Hanging fabrics	8	18	" elements in design	6	40	
Hangings and table covers, Borders for	7	47	" ornament	6	34	
Harmachis	3	25	Inflorescence, Definition of	6	43	
Harmony in adaptation of human figure to design	6	58	Influence of architecture	3	4	
" " secondary lines	8	4	" " conventionalism	8	2	
Head of Medusa	6	67	" " Italian art in German Renaissance	5	51	
Heating of ancient castles	4	126	" " Mohammedanism	4	70	
Heavy Antique Egyptian Alphabet	5	69	" " nature	3	9	
Heraldry	4	127	" " religion	3	5	
" in French art	5	34	" " in Egyptian ornament	3	16	
Historic lettering	5	61	" " " in Gothic art	4	99	
" " Modern use of	5	59	" " the church	4	34	
" " Object of studying	5	56	" " Nile on Egyptian ornament	3	14	
" " Value of study of	3	13	Influences affecting different styles of art	5	56	
Holbein	5	52	Ingenuity of Byzantine ornament	4	55	
Holland and England, Political ties of	5	53	Insects in design	6	53	
Horn	3	26	Intention of Renaissance artists	5	2	
How to bisect a given angle	8	33	Interior of Egyptian temple	3	19	
" " study ornament	3	14	Intricacy of Celtic ornament	4	97	
Human figure	6	56	Introduction of Renaissance art into England	5	3	
" figure, Application of wings to	6	64	" " Renaissance art into England	5	52	
" figure, Details of, combined with animal and floral forms	6	61	" " Renaissance art into France	5	3	
" figure, Difficulty of free rendering of	6	60	Invention and imitation	6	13	
" figure, Harmony in adaptation of, to design	6	58	" of printing, Effect of	5	5	
" figure, Proportions of	6	56	Inventive ornament, Definition of	6	13	
" figure used in design	6	34	Ionic architrave	4	13	
" figures as supports	6	62	" order	3	64	
Hyperbola	3	61	" "	4	8	
" Method of drawing	3	62	" " Roman	4	24	
" Method of drawing tangent to	3	63	Ironwork, Renaissance	5	18	
Hypostyle hall	3	17	Italian art and literature	5	5	
" " at Karnak	3	23	" " Roman influence on	5	6	
			" aversion to Gothic form	5	6	
			" design of the eighteenth century	7	35	

INDEX

xv

	Sec.	Page		Sec.	Page
Italian Gothic art	4	106	Machine, Carding	9	7
" Renaissance	5	4	" Gilling	9	10
" " Foliated ter- minations in	5	13	" Jacquard	9	25
" " French ideas of	5	29	Maltese cross	6	41
" " Origin of	5	4	Masses, Distribution of	8	5
" " Scrollwork in	5	12	Meaning of decoration	3	1
" " Value of, to the designer	5	10	" " order	4	2
Italy, Renaissance art in	5	3	" " ornament	3	1
J			Medieval Roman alphabet	5	69
Jacquard cards	9	26	Medusa, Head of	6	67
" machine	9	25	Methods in designing, Advantage of a knowledge of numerous	7	24
Japanese art	4	63	Metope	4	6
" ornament	4	59	Mezzo rilievo	5	7
Jug	8	46	Michael Angelo	5	21
Junction of lines, Tangential	7	3	Misinterpretation of Gothic	4	121
K			Mode of living in ancient castles	4	126
Karnak, Hypostyle hall at	3	23	Modern use of historic ornament	5	59
" Temple of	3	23	Modillion	4	29
Kinds of conventionalism	6	25	Modules	4	8
Knitting and carpet yarns	9	10	Mohammedan decoration	4	72
L			" religion, Effect of, on light and shade	6	7
Labyrinth	3	37	Mohammedanism in Arabian art	4	70
Lace curtain design	7	44	" Influence of	4	70
Lack of progressiveness in Indian art	4	64	Moldings, Classic	3	60
" " symmetry in French fur- niture	5	49	Monogram of Christ	6	41
Latin cross	6	41	Monreale, Cathedral of	4	55
Laws of nature	3	57	Monument of Lysicrates	4	14
Laying out a design for fabric	9	20	Moorish art	4	80
Leaves, Development of	6	27	" " Construction and dec- oration in	4	83
Lettering, Historic	5	61	" " Derivation of	4	80
Literature and art, Italian	5	5	" " Primary colors in	4	86
Light and shade	6	7	" coloring, System of	4	90
" antique Egyptian alphabet	5	65	" geometrical ornament, Construction of	4	98
Lily, Greek	3	67	" ornament	4	80
Limit of outline	6	2	" " Blending of col- ors in	4	91
Limitless variety of patterns	6	21	" " Characteristics of	4	81
Linear ornament	6	15	" " Coloring in	4	89
Lines, Arrangement of	6	4	" " Consistency of	4	87
" Continuity of	8	5	" " Conventional- ism in	4	88
" Emphasis of curved	8	3	Mule, Description of	9	9
" Harmony of secondary	8	4	Multisymmetry, Definition of	6	15
" in nature, Harmony of	8	5	Mummy	3	35
" Tangential junction of	7	3	Mutules	4	7
Lining	8	11	N		
Link borders	7	46	Natural elements	6	34
Lizards and snakes	6	55	" " in design	6	41
Lotus	3	26	" forms in design	6	28
Lysicrates, Monument of	4	14	" ornament	6	24

	<i>Sec. Page</i>		<i>Sec. Page</i>
Natural ornament, Union of, with		Ornament	6 15
geometrical	6 24	" Ancient	3 9
" treatment of nature . . .	6 31	" Animal	6 34
Naturalistic treatment of wall sur-		" Arabian	4 69
face	8 26	" " Development of . . .	4 69
Nature, Conventional treatment of	6 31	" Architectural	6 34
" Geometrical forms in . . .	6 28	" Arrangement of, in Ara-	
" Harmony of lines in . . .	8 5	bian art	6 29
" Influence of	3 9	" Arrangement of, in In-	
" Natural treatment of . . .	6 31	dian art	6 29
" Oval in	6 18	" Asiatic	4 59
" Realistic treatment of . . .	6 30	" Assyrian	3 47
" Suggestions from, for the		" Ball-flower	4 101
design of vases and		" Byzantine	4 39
cups	8 48	" Celtic	4 95
Necessity of conventionalism . . .	6 12	" " Animal forms in . . .	4 96
Nimbus	6 41	" " Characteristics of . . .	4 96
O			
Obelisks	3 21	" " Intricacy of	4 97
Object of studying historic orna-		" " Origin of	4 95
ment	5 56	" " Symbolism in	4 98
Octagonal staircase at Blois . . .	5 31	" Character of Roman . . .	4 31
Old designs, Adherence to	5 57	" Characteristics of Per-	
" English alphabet	5 79	sian	4 78
Order, Composite	4 30	" Characteristics of Turk-	
" Corinthian	3 64	ish	4 76
" Doric	3 64	" Chinese	4 59
" Greek-Corinthian	4 14	" " and Idealism	4 60
" " Doric	4 3	" Class of	3 30
" Ionic	3 64	" Classic	4 1
" "	4 8	" "	3 52
" Meaning of	4 2	" Comparison of Persian	
" Roman-Corinthian	4 27	and Arabian	4 78
" " Doric	4 21	" Comparison of Persian	
" " Ionic	4 24	and Indian	4 79
" Tuscan	4 19	" Constructive	3 31
Orders, Architectural	3 58	" Conventional	6 28
" " Meaning of	4 2	" Decorative	3 30
" Comparison of Greek and		" Egyptian	3 14
Roman	4 20	" " Antiquity of	3 15
" Greek	4 2	" " Classes of	3 30
" of design	3 58	" " Consistency of	3 29
" Roman	4 17	" " Conventional-	
Oriental art	4 59	ism of	3 29
" Influence in Byzantine art	4 39	" " Influence of	
" people, Characteristics		Nile on	3 14
of	4 59	" " Influence of re-	
Origin of Celtic ornament	4 95	ligion on	3 16
" " Gothic and Byzantine or-		" Elements of	6 1
nament	4 39	" Elizabethan, Character-	
" " Italian Renaissance . . .	5 4	istics of	5 54
" cup	8 41	" Etruscan	3 77
" Renaissance art	5 1	" Expression of taste in	
" set styles	3 10	savage	3 11
" tattooing	3 10	" Fitness of	6 16
		" General arrangement	
		of, in surface work . .	8 11

	<i>Sec.</i>	<i>Page</i>		<i>Sec.</i>	<i>Page</i>
Ornament, Geometrical	6	34	Ornament, Wings in	6	49
" Gothic	4	99	Ornaementation in checker pattern		
" " Evolution of	4	108	" " for fabric	9	21
" Greco-Roman	3	79	" " of fabrics	9	22
" Greek	3	52	" " Laying out	9	22
" Representative types of	3	56	" " ple fabrics	9	28
" Historic, Modern use of	5	59	" Reversion of treatment in	6	8
" " Object of studying	5	56	Oslris	3	26
" " Value of study of	3	13	Outline, Limit of	6	2
" History of	2	1	Oval in nature	6	13
" How to study	3	14	" Repetition, contrast, and variety expressed in the	6	13
" Indian	4	64			
" " Characteristics of	4	65	P		
" Industrial	6	34	Painted Roman decorations	4	82
" Ingenuity of Byzantine	4	55	Paneling	8	11
" Japanese	4	59	"	8	17
" Linear	6	15	Papyrus	3	26
" Meaning of	3	1	Parabola	3	60
" Moorish	4	80	Parallelogram, Design based on the	7	34
" " Blending of colors in	4	91	Parent stem	7	9
" " Characteristics of	4	81	Parthenon	3	55
" " Coloring in	4	89	Pattern, Ball	7	31
" " Consistency of	4	87	" Drop	7	12
" " Convention- alism in	4	88	" Turn-over-and-drop	7	22
" " Derivation of	4	80	" Unit of	7	12
" " geometrical, Construction of	4	92	Patterns, Limitless variety of	6	21
" Natural	6	24	Pedestal, Roman Doric	4	23
" Origin of Gothic and Byzantine	4	89	" Tuscan	4	19
" Persian	4	78	People, Types of	3	26
" Pompeian	3	79	Periods of French Renaissance	5	24
" "	3	82	Perpendicular characters	4	110
" Primitive	3	9	" period	4	100
" Primitiveness of Chinese	4	59	Persian and Arabian art compared	4	78
" Renaissance	5	1	" ornament, Characteristics of	4	78
" Representative	3	30	Plaster forms of treatment	8	20
" "	3	33	Pilasters	8	32
" Roman	4	1	Pile fabrics	9	20
" Romanesque	4	33	" "	9	27
" Style in	3	30	" " Ornamentation of	9	28
" Surface	3	66	Plain fabrics	9	13
" threads	9	20	Planning and drawing the design	7	18
" Turkish	4	76	" design	7	5
" Type of	3	31	" turn-over method in design	7	20
" Vegetable	6	34	Plan of Egyptian temple	3	22
" Western	4	95	Plant form, Conventionalizing a	6	30
			Political ties of England and Holland	5	53
			Polychromy	3	72
			Pompeian art	3	79

	<i>Sec. Page</i>		<i>Sec. Page</i>
Pompeian ornament	3 79	Renaissance art, Origin of	5 1
" "	3 82	" artists, Intention of	5 2
Pottery, Ancient decoration of	6 15	" English	5 51
" Brush decoration of	6 23	" " Dutch influ- ence in	5 53
Powdered effect in designs	7 29	" French	5 24
Powdering, Spotting and	8 11	" " Periods of	5 24
Practical Design	7 1	" " Rapidity of transition in	5 24
Prehistoric emblems	6 40	" frieze	8 28
Primary colors in Moorish art	4 85	" German	5 51
Primitive ornament	3 9	" German, Influence of Italian art in	5 51
Primitiveness of Chinese ornament	4 59	" Introduction of, into England	5 52
Principles, Fundamental, of figure design	6 60	" Ironwork	5 18
" involved in practical design	7 1	" Italian	5 4
" of decoration	3 2	" ornament	5 1
" " human figure	6 56	" period, Scope of	5 2
" " wings	6 50	" Venetian	5 16
Printing, Invention of	5 5	Rendered perspective	6 1
Profile of human face used to form design for outline of vase	8 48	Repeat and unit	7 7
Proportion	7 5	" Effect of	7 11
" of unit	8 24	" in carpet design, Width of	7 15
Propriety of design for hanging fabrics	8 18	" Size of, in damasks	7 40
Propylon	3 18	" " " wall papers	8 22
Purity of French Renaissance style	5 4	" Uniformity of, in border and filling	7 39
Purpose, Consideration of, in design	6 32	Repeats, Unequal	7 41
Purposes of fabrics	9 1	Repetition	7 1
Pylons	3 17	" contrast, and variety	6 13
Q			
Quadrupeds and running orna- ments	6 47	Representative ornament	3 30
R			
Radiation	7 8	" types of Greek ornament	3 56
" and symmetry	6 14	Reversion of colors	6 7
Ramesseum	3 22	" " treatment in orna- mentation	6 8
Rapidity of transition of French Renaissance	5 24	Revival of antique art in England	5 55
Rayonnant capitals	4 117	" " classic style	5 2
" period	4 116	Rococo period	5 25
Realism and conventionalism	6 30	Roman acanthus	4 31
Realistic treatment of nature	6 30	" alphabet, Medieval	5 69
Rectangle of design, Enclosing	7 14	" and Greek orders, Com- parison of	4 20
Relation of colors	6 7	" Corinthian order	4 27
Religion, Influence of	3 5	" Doric order	4 21
" " " in Gothic art	4 99	" " entablature	4 24
Remedy for defects	7 7	" " pedestal	4 23
Renaissance art	5 1	" domination, System of building under	4 34
" " in Italy	5 3	" empire, Fall of	4 33
" " Introduction of, into England	5 3	" influences on Italian art	5 6
" " Introduction of, into France	5 3	" Ionic order	4 24
		" orders	4 17
		" ornament	4 1

INDEX

xix

	Sec.	Page		Sec.	Page
Roman ornament, Character of . . .	4	31	Spinning fibers	9	7
" painted decorations . . .	4	32	" Preparing wool for . . .	9	8
Romanesque art	4	33	" Throstle	9	11
" Sculpture in . . .	4	58	Spot designs, Simple	7	26
" ornament	4	33	Spotting and powdering	8	11
" style, Development . . .	4	33	Staircase of Château de Blois . . .	5	31
of	4	33	Stem, Parent	7	9
Rovings	9	11	" Thickening of, at points of		
Rugs and floor coverings, Borders			departure	7	42
for	7	48	Striped effect in drop patterns . .	7	19
Rules of coloring in Indian fabrics	4	65	Stripes, Style in historic	7	54
Running ornaments and birds . .	6	47	" in early Gothic period . .	7	54
S					
Sacred bark	3	36	" Spanish fabrics	7	54
Saint Andrew, Cross of	6	41	" " woven goods	7	52
" Mark's church	4	51	" Propriety of, in hanging		
Sansovino, Giacomo Tatti	5	22	fabrics	8	19
Satins, Method of weaving	9	16	Striping and banding	8	11
Savage, Decorative theory ex-			Structural lines, Emphasis of . . .	8	2
hibited by the	3	12	Study of grouping	6	6
ornament, Expression of			Style and ornament	3	30
taste in	3	11	" Development of Roman-		
Scarabeus	3	28	esque	4	33
"	6	41	" Examples of Byzantine . . .	4	42
Scarcity of Chinese architecture .	4	61	" in historic stripes	7	54
Scope of Renaissance period . . .	5	2	" of French furniture	5	48
Scotia	3	63	Styles, Origin of set	3	10
Scroll	3	41	" Effect of traditional	3	11
" Volute	6	37	Stylobate	4	3
Scrollwork in Italian Renaissance	5	12	Subdivision of space	6	3
Sculpture, Assyrian	3	48	Subordination	7	4
" Greek	3	56	Supports, Human figures as . . .	6	62
" in Byzantine art	4	58	Surface decoration, Definition of .	6	3
" " Romanesque art . . .	4	58	" " General rules		
Secondary lines, Harmony of . . .	8	4	of	3	8
Sections, Conc	3	60	" ornament	3	66
Sekos	3	17	" varied by the placing of		
Set styles, Origin of	3	10	lines	6	4
Shade, Light and	6	7	Surfaces and Solids, Drawing		
Shaft	4	12	plate	2	24
Shape, Influence of	8	1	Symbol of Egyptian divinity . . .	6	40
Silk fibers	9	6	Symbolic devices	3	3
" yarn	9	12	Symbolism	6	40
Singles	9	11	" In Celtic ornament	4	98
Size of repeat in damasks	7	40	Symmetrical designs	7	14
" " " wallpapers	8	22	Symmetry and balance	7	3
Snakes and lizards	6	55	" " radiation	6	14
Soffit	4	7	System, Feudal	4	121
Space, Subdivision of	6	3	" of building under Roman		
Spandrels, Early English	4	112	domination	4	34
Spanish fabrics	7	54	" " design, Selection of . .	7	25
Sphinx	3	25	Systems of construction	7	24
"	6	45	" " Moorish coloring	4	90
" Egyptian	6	45	T		
" Greek	6	51	Table covers and hangings, Bor-		
			ders for	7	47

	Sec.	Page		U	Sec.	Page
Tangential junction of lines	7	3	Unequal repeats	7	41	
Tankard	8	44	Union of natural with geometrical ornament	6	24	
Tapestry of the thirteenth and fourteenth centuries	8	14	Unit and repeat	7	7	
Taste in conventionalism	6	32	" Definition of	7	6	
Tattooing, Origin of	3	10	" of pattern	7	12	
Temple, Egyptian	3	17	" Proportion of	8	24	
" Plan of	3	22	Units, Irregular	7	29	
" of Athena Polias	3	70	Unity	7	5	
" " " "	4	9	" Assemblage of details to secure	6	8	
" Karnak	3	23	" in design	6	1	
Terminal	6	64	Utensils and vases, Origin of	8	41	
Textile fabrics, General considerations in	9	1				
Thickening of stem at points of departure	6	42		V		
Thoth	8	26	Valois period	5	24	
Thread, Characteristics of worsted . .	9	11	Value of Italian Renaissance to the designer	5	10	
Threads, Character of	9	4	" study of historic ornament	3	13	
" Ornament	9	20	Variation of surface by the placing of lines	6	4	
" Warp	9	2	Variety and contrast	7	2	
" Weft	9	2	" of designs from same elements	6	11	
Three great laws of nature	3	57	" possible on certain geometrical bases	7	26	
Throstle spinning	9	11	" repetition, and contrast	6	13	
Thumb molding	4	6	Vase, Development of the	8	45	
Torus	3	63	" Profile of human face used to form design for outline of	8	48	
Tower of the winds	3	65	Vases and cups, Suggestions from nature for design of	8	48	
Tracery	4	101	" utensils, Origin of	8	41	
" French	4	105	Vegetable forms	6	41	
Traditional styles, Effects of	3	11	" ornament	6	34	
Tram	9	12	Velvets and plushes	9	27	
Treatment, Reversion of, in ornamentation	6	8	Venetian Renaissance	5	16	
Triglyph	4	6	Versailles	5	47	
Trisymmetry, Definition of	6	15	Vertebrate borders	7	46	
Turkish art	4	76	Vertical and horizontal decorating, Effects of	8	21	
" ornament	4	76	Vignola	4	17	
" Characteristics of	4	76	Vitruvius	5	6	
Turn-over-and-drop patterns	7	22	Volute	4	12	
" method, Advantage of the	7	20	" scroll	6	37	
" method, Elimination of faults in	7	22				
" method in design, Planning the	7	20		W		
" pattern based on the diamond	7	33	Wall decoration	8	20	
Tuscan column	4	20	" Byzantine	4	47	
" entablature	4	20	" Chateau de Blois	5	42	
" order	4	19	" Methods of treatment in	8	20	
" pedestal	4	19	" paper, Coloring in	8	25	
Twills	9	14	" design	8	22	
Twist, Effect of, in weaving	9	3	" Size of repeat in	8	22	
Type of ornament	3	31				
Types of people	3	26				

INDEX

xxi

	<i>Sec. Page</i>		<i>Sec. Page</i>
Wall surface, Naturalistic treatment of	8 26	Wings, Egyptian method of attaching, to human figure	6 64
Warp and weft in different colors, Effect of	9 22	" in ornament	6 49
" pile fabrics	9 28	" Proportions of	6 50
" threads	9 2	Wivern	6 45
Waste in cutting carpets	7 17	Wool fibers	9 4
Weave, Basket	9 15	" for spinning, Preparing	9 8
Weaving	9 2	Woolen yarn	9 8
" Effect of twist	9 3	Worsted thread, Characteristics of	9 11
Weft pile in fabrics	9 27	" yarn	9 8
" threads	9 2		
Western art	4 95	Y	
" ornament	4 95	Yarn, Cotton	9 12
Wilton carpets	9 27	" Flax	9 12
Window tracery, French	4 105	" Silk	9 12
Winged disk	3 27	" Woolen	9 7
" globe	3 27	" Worsted	9 8
Wings, Application of	6 51	Yarns	9 7
" " " to human figure	6 64	" Knitting and carpet	9 10
" Assyrian method of attaching, to human figure	6 64		
		Z	
		Zenith of architectural development	4 115

